THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal ESTABLISHED 1835 · THE RAILWAY RECORD.
RAILWAYS ILLUSTRATED · THE RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (6 lines)

Annual subscription payable in advance and postage free:
British Isles and Abroad.....£2 5s. 0d.
Single Copies .....One Shilling

Registered at the General Post Office, London, as a Newspaper

VOL. 75 No. 20 FRIDAY, NOVEMBER 14, 1941

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DIESEL RAILWAY TRACTION SUPPLEMENT

The November issue of THE RAILWAY GAZETTE *Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 1*s.*

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export

DISPATCH OF "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and machinery for such dispatch, and any reader desirous of arranging for copies to be delivered to an agent or correspondent overseas should place the order with us together with the necessary delivery instructions.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas, as they are stopped under the provisions of Statutory Rules & Orders No. 1190 *of* 1940, *and No.* 359 *of* 1941

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 *a.m. till* 3.45 *p.m.*
The office is closed on Saturdays

Railways under the Revised Agreement

MR. C. H. NEWTON, Chief General Manager of the L.N.E.R., in the current issue of the *London & North Eastern Railway Magazine* makes some useful comments on the position of the railways under the revised financial agreement with the Government. He points out that it cannot be emphasised too strongly that the payment of a fixed annual amount by the Government does not mean that the railways have no further responsibility for the level of expenditure; wasteful or injudicious expenditure is inexcusable at all times, but especially so in present conditions. Expenditure on essential works or services, in particular those related directly to the prosecution of the war, can obviously be justified, but all other expenditure has to be kept down to the lowest level consistent with efficiency. Nor are the railways absolved from the responsibility for seeing that railway revenue is maintained subject to the over-riding necessity that operations are primarily in the interests of the war effort. Mr. Newton also points out that the railways are carrying on most of their trains as much passenger traffic as can be handled, and that it is not unlikely, in order to make way for additional goods and coal traffic, that the Government may decide to take steps to curtail further the amount of passenger travel As to traffic for Government Departments he states that instructions have been issued recently designed to simplify methods of charging.

Ministry of Production Rumours

Recently there have been renewed rumours that the Prime Minister has under consideration the appointment of a Minister of Production. *The Manchester Guardian* on November 1 gave renewed currency to this suggestion and added that the Minister might be Lord Beaverbrook, translated from the Ministry of Supply, or a new Minister rendering the present Minister of Supply superfluous or reducing his status. There is, of course, already in being a Production Executive over which Mr. Ernest Bevin presides, and this was part of the machinery Mr. Churchill set up as an alternative to a Ministry of Production when such a post was suggested many months ago. There can be no doubt that the whole production policy of this country has aroused disquiet, and in THE RAILWAY GAZETTE of August 15 it was suggested that there was room, and indeed need, for the creation of an Industrial General Staff, the sole aim of which would be to make the best and most efficient use of the industrial fabric. We then suggested that all members of this staff should be full-time practical business men withdrawn from their industries, and devoting the whole of their energies to the task before them. Since that time nothing has occurred to modify the view as to the needs of an organisation of this kind; on the contrary with the increasing calls upon both national production and manpower the need for the most practical and expert guidance and control in this matter has been increased.

National Cost of Train Delays

A cry from the heart was published in *The Daily Telegraph* the other day from a correspondent whose suffering through the dilatory behaviour of suburban trains had become intolerable. "Last winter," he wrote, "to my knowledge, engineers engaged in vitally important work lost thousands of hours in the aggregate, not to mention wasted rest time and frayed morale, because trains whose total journey was under 50 miles were from 10 to 70 minutes late." He refuses to accept the excuse of bombing and blackout difficulties, because the services had been, he said, almost as erratic during the long daylight hours of summer. He had himself just waited, with over 100 other passengers, for a train which was 28 minutes late after a 25-mile journey. "What a story that crowd of passengers could have told, of the personal loss, wrecked appointments, and missing of other trains, due to the late arrival of this at the London terminus; and this loss is multiplied daily all over the country! Reasonable punctuality of local trains," he concludes, "would increase production by a least 10 per

cent.," and he appeals to the Ministry of War Transport to tackle the matter. There can be no doubt that unpunctuality is a very serious detriment to the country's war effort. We know the reasons given for it. Enginemen, for example, often say that they are unable to make up lost time because of bad coal and the poor condition of their engines, and locomotive departments complain of shortage of staff and other causes for this. Surely the matter should be pursued further to see that so vital a matter as the proper maintenance of locomotives and the quality of their coal is treated with first class priority, if neglect causes such widespread dislocation. The whole subject has become so important that we make no excuse for urging its consideration as a matter of prime policy at the present time.

Overseas Railway Traffics

Another encouraging list of increases is shown by British-owned railway companies in Argentina in the 17th and 18th weeks of the present financial year. Total traffic gains registered by six of the companies during the two weeks amount to 2,714,450 pesos. The Central Argentine increase of 1,133,550 pesos is the largest, followed by the 577,000 pesos of the Buenos Ayres Great Southern. On the Entre Rios the aggregate increase to November 1 is 1,006,000 pesos. Antofagasta traffics for the 44 weeks to November 2 amount to £848,230, an advance of £102,330, and the aggregate decrease on the Great Western of Brazil has been reduced to £27,900.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
Buenos Ayres & Pacific* ...	18th	1,320	+230	22,980	+2,876
Buenos Ayres Great Southern*	18th	2,319	+272	37,823	+4,155
Buenos Ayres Western* ...	18th	934	+211	14,777	+3,371
Central Argentine*	18th	1,878	+527	33,102	+8,038
		£	£	£	£
Canadian Pacific	43rd	1,492,200	+313,600	36,007,030	+8,277,200
Bombay, Baroda & Central India	29th	304,800	+22,425	6,076,725	+424,800

* Traffic returns in thousands of pesos

Canadian Pacific aggregate gross earnings for the first nine months of 1941 amounted to £31,691,400, an increase of £7,321,800, and the aggregate net earnings of £5,945,600 showed an improvement of £1,887,600.

The Cost of Transport and Inflation

With the avowed object of showing that in transport is to be found an element which can be held responsible more than any other for increased costs, and thus as the starting point of the inflationary spiral, a correspondent was accorded space for a lengthy article in *The Times* of November 4. In the main the article is an academic discussion; the author evolves a figure, for which he gives no basis, of £1,100,000,000 a year as the cost of transport; neither does he give any indication of the services which covered his phrase " cost of transport." To take transport by railway alone, the average overall increase in railway rates compared with the pre-war level is about 14½ per cent. and the correspondent in question will be fully aware of many national services where the rise in costs is considerably higher. It would seem probable that he has indulged in the fascinating but misleading pastime of averaging averages, for he makes it clear that into his " manufacturer's transport costs " he takes a wide variety of items, such as the transport cost represented in the heat, light, food, and clothes of employees, without any indication as to how, if at all, the figures are broken down. Apparently the cure for what is regarded as a high cost of transport is some form of grandiose reorganisation and planning of distribution for the familiar purpose of achieving solely " efficient and economical administration." No indication is given as to how or by what supermen the " new order " is to be achieved, but although the correspondent has little use for those who would avoid disturbing the normal channels of trade, in our view this is not the time to indulge in vast schemes of reorganisation of vital basic services. Hypothetical benefits are too frequently more than offset by practical disorganisation and the disruption of well tried and efficient methods of operation.

Operations of the Export—Import Bank

From time to time in these columns reference has been made to the part which has been played by the U.S. Export-Import Bank in furthering the facilities available to United States manufacturers, more particularly in South American markets. Mr. Warren Lee Pierson, President of the bank, has shown recently that the institution has financed the purchase of United States railway equipment for the Argentine State Railways, and in Brazil has performed the same function for the purchase of United States locomotives for the Sorocabana and other railways, as well as the purchase of U.S. road building machinery for new Government highways to air bases. In Chile the bank's services have been available for the purchase of U.S. railway equipment, and in Costa Rica it has financed the purchase of construction material for the sector of the Pan-American Highway which runs through that country. The statement of loans and commitments of the bank as at August 15, 1941, showed that the bank had authorised a loan of $250,000 for railway equipment for the Argentine State Railways. For the Central Railway of Brazil the loan was $7,000,000; for the Sorocabana three loans have been authorised—the first for $292,500 for locomotives, the second $227,500 for the same purpose, and the third, of $4,340,000, for electrical equipment. There was also a loan of $1,575,000 for steel rails for the Rio Grande do Sul Railway, and another of $1,060,000 for coaches and equipment for the Brazilian Government Railways. In Chile, loans of $600,000 and of $1,600,000 have been authorised for the purchase of locomotives for the Chilean State Railways, and in Mexico of $500,000 for equipment for the National Railways of Mexico.

A Dublin Train Service Improvement

The City of Dublin Junction Railway, just over 1¼ miles in length, from Newcomen Bridge junction and Amiens Street across the Liffey to Westland Row, has always been a link of great importance. Before the railway amalgamations in Eire, the through trains or coaches of the Great Northern Railway from Belfast, the Midland Great Western Railway from Galway, and the Great Southern & Western Railway from Cork, all used it in order to obtain access to the Dublin & South Eastern line at Westland Row, and so to run through to Dun Laoghaire to connect with the Holyhead boats. After the grouping of the G.S. & W., M.G.W., and D. & S.E. Railways into the Great Southern Railways system, the existence of this link made it possible to close the unremunerative Broadstone terminus in Dublin, and to divert the sparse Midland Great Western service into Westland Row. A further step has been taken from October 27 in which the City of Dublin Junction line is an essential factor. Certain Great Northern trains whose journeys originate at stations between Drogheda and Howth, and have hitherto terminated at Amiens Street, are now running through to Westland Row, calling *en route* at Tara Street, and in some cases continuing to Dalkey and Greystones. Five morning services are so arranged, and four services to the Great Northern line in the evening, at convenient hours. A similar arrangement was in force some years ago, but its value was greatly reduced by the time lost in changing engines at Amiens Street, whereas now the Great Northern locomotives work through. These are in addition to the suburban trains of the Dublin & South Eastern Section, of course, the great majority of which have for long worked through between Bray or Dalkey and Amiens Street.

The Plight of the Non-smoker

We publish on another page a strong letter from Mr. Fred W. Dalley on the subject of the abuse of non-smoking accommodation on railways, and we wish we could hope it might produce some result. Mr. Dalley goes beyond our own mild suggestions, but even if the latter were acted upon there would be an immediate amelioration of the position. Our suggestion was merely that the " non-smoking " labels, which on some railways are fixed on only two windows of the compartment, should be on every window and on each partition inside the compartment as well. The latter pre-

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caution is necessary to enable travellers to be made aware of the type of accommodation in which they are travelling after blackout time compels the drawing of the blinds. We suggested, further, that these labels should be maintained in good condition, for occasionally they become disfigured or obliterated. Surely this small action would not appreciably add to the difficulties of the railway staff, and at a time like the present, when the non-smoker should, in the interests of the war effort and the reduction of imports be encouraged, it is little enough to ask. How distorted the outlook of some persons can become is instanced by a recent encounter we ourselves had in a clearly-labelled non-smoking compartment on the Southern Railway which, in our experience, is the most considerate of the companies to non-smokers. A fellow-traveller deliberately lit a pipe after we had drawn his attention to the non-smoking notice, with the remark "there's a war on," as if that excused his own inconsideration of others. Rather should it make everyone interested in the winning of the war considerate to his fellows, for unnecessary opposition tends, however slightly, to weaken the war effort.

Mr. Frank Pick

THE sudden death of Mr. Frank Pick on Friday last, at his home in north-west London, removes one of the great personalities associated with London Transport as a co-ordinated enterprise. For three quarters of a century the various units which have contributed to the provision of transport in the metropolitan area have produced outstanding names, for all the undertakings now controlled by the London Passenger Transport Board were conceived and sponsored by private enterprise; even the L.C.C did not originate London's tramways, but only acquired them from the companies which built them. The Metropolitan and the District Railways date back to the 60s, and they produced such outstanding names as Sir Edward Watkin and James Staats Forbes. The pioneer "tubes" were the City & South London and the Central London, but the conception and early development of what became known as "London's Underground" was the result of the work of the financiers. Well-known names then were: Whitaker Wright; Pierpont Morgan; Yerkes, Perks, and Speyer. After the parliamentary fights there was the long period of construction, and the engineers were Dalrymple Hay, Chapman, and Zac Ellis Knapp. Then came 30 years of openings, operation, amalgamations, and extensions. Two pioneers in this period were Sir George Gibb and R. H. Selbie.

The "Underground" acquired the company tramways, and the bus companies, and the names of Stanley and Pick became familiar. Their work of co-ordination culminated in the formation eight years ago of the London Passenger Transport Board, which now employs a staff of over 86,000 and under Government control during the war has joined the "Big Four" main-line railways to make them become the "Big Five." Since the retirement of Sir George Gibb, Lord Ashfield (or Albert Stanley, as he then was) has been No. 1, and for many years Frank Pick was No. 2. If Lord Ashfield had not come to London in 1907, would London Transport have achieved the degree of perfection it has today? We think not. And would this degree of perfection have been much lower without Frank Pick? We think so. The first Underground Electric trains, with their red plush seats and dark mahogany panelling, were pretty grim. So were the Central London stations with their white brick walls Compare them with the new trains and the new stations; and the old York Street offices with 55, Broadway. Posters deserve a special word. Frank Pick's early efforts, although quite simple posters carried out in two colours, reflected thought and care to obtain the maximum effect. Emboldened by success he next sought the help of the Royal Academician and also encouraged the younger set of artists from Art Schools up and down the country. Frank Pick, who retired from London Transport in May of last year, after seven years as Vice-Chairman of the world's greatest urban transport undertaking, had a career to be envied. An appreciation from Lord Ashfield appears on page 507.

Buenos Ayres Western Railway

REVENUE for the year ended June 30, 1941, was £91,518 greater than for the previous year, and except for 1937 was higher than in any other year since 1932. This satisfactory improvement was, however, more than offset by an increase of £101,647 in working expenses brought about by the great advance in the price of all materials, particularly fuel. Net receipts were thus reduced by £10,129. From the net receipts of £582,853 a sum of £232,797 (against £248,141) had to be deducted for exchange differences. After providing for all fixed charges there remains a credit balance on revenue account of £5,549 which it is proposed to carry forward. A moratorium for the payment of interest on the debenture stocks and 5 per cent. three-year secured notes has been granted to July 1, 1943. In addition, an agreement has been entered into between this company, the Buenos Ayres Great Southern Railway Company, and the Buenos Ayres Midland Railway Company, whereby the Western company's contribution under the joint guarantee of the service of the Midland securities is postponed until after the termination of the moratorium period. Some operating figures are compared in the accompanying table:—

	1939-40	1940-41
Passenger journeys	26,101,724	26,825,570
Tons of goods	2,446,396	2,392,191
Train-kilometres	9,216,000	9,107,000
Total ton-km.	823,980,000	877,834,000
Operating ratio, per cent.	83·32	84·02
	£	£
Passenger receipts	868,650	859,271
Goods receipts	1,495,082	1,466,089
Gross receipts	3,555,572	3,647,090
Working expenses	2,962,590	3,064,237
Net receipts	592,982	582,853

Suburban passenger returns recorded a satisfactory increase in numbers and earnings, but general line travel declined, so that total passenger receipts were down by £9,379. First-class receipts were £437,086, a decrease of £8,908, and represented 52·02 per cent. of total passenger earnings, exclusive of £19,001 from Government traffic. Parcels and luggage brought in £9,807 more, and livestock traffic receipts improved by £90,524, or 11 per cent. This increase was due to the larger export in 1941 for account of the British Government and large canned meat orders from the United States. Although receipts from wheat traffic advanced by £111,090, or 31 per cent., a smaller total tonnage of grain was railed. General merchandise receipts were £39,679 lower, and notwithstanding satisfactory returns from cement, hay, stone, and wool, goods receipts as a whole were £28,993 lower. Fuel charges rose by £137,327 as a result of slightly higher consumption and an increase in price, and electric traction current costs were up by £18,443. Otherwise there was a saving in working expenses. Work on the change of frequency from 25 to 50 cycles of the electric current operating the suburban train services is progressing satisfactorily. Noting that traffics at the present moment are not unsatisfactory, the report contains a warning that the outlook as to the all-important grain market is so obscure that it would be venturesome to hazard a forecast of earnings for the current financial year.

The Burma Railways

THE Burma Railways were constructed by the Indian State, but were leased to a company for working from 1896 to 1928. Since January 1, 1929, however, this system, which is entirely of metre gauge, has been worked first by the Government of India, but with the separation of India and Burma on April 1, 1937, the Burma Railways became an autonomous entity owned and worked by the Government of Burma. The main lines run from Rangoon to Mandalay and Rangoon to Prome, and there are a number of important branches. Public attention has recently been directed to the branch to Lashio in view of its importance as providing the railhead for the Burma Road to China. Although the Burma Railways have no international rail connection at the present time, the Lashio branch is being extended to the Chinese border with the ultimate object of being linked with the rail system of Free China, and for the past half century long-term plans have contemplated an extension

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north-westward to connect with the Assam-Bengal Railway. Detailed surveys have been carried out at different times of three distinct groups of Indo-Burma routes *via* the Hukong Valley in the north, *via* Manipur, and across the Arakan Yomas. The total track mileage of the Burma Railways is 2,856, excluding 1,852 miles of first track, 414 miles of other main track, and 590 miles of yards and sidings.

All the locomotives are of the steam coal-burning type and on March 31, 1940, they totalled 358. Passenger carriages numbered 776 with an average seating capacity of 53, and other coaching vehicles totalled 380. Goods wagons numbered 7,620, with a total capacity of 104,810 tons, or an average of 13·7 tons. In addition there are 1,982 other goods vehicles such as timber and cattle trucks. Locomotives are equipped with vacuum and steam brakes, coaching stock with vacuum, and goods vehicles with hand brakes, though large numbers are also vacuum braked or piped. The total cost of locomotive coal was Rs. 3,637,735 for the fiscal year ended March 31, 1940. Coal consumed on locomotive services was 190,558 tons. Locomotive miles numbered 9,643,301 giving an average of 44·26 pounds of coal per locomotive-mile at a cost of Rs. 0·37 (6⅜d.).

Freight originating on the Burma Railways amounted to 4,001,000 tons during the fiscal year ending March 31, 1940, as compared with 4,057,000 tons during the previous comparable period The railways received from or carried to the industrial railway of the Burma Corporation Limited 140,133 tons of metals and ores during 1939-40, compared with 183,394 tons during the previous year. Actually iron ore is carried by the Burma Railways and Burma Corporation Railway as a flux for smelting the silver-lead ore, and the finished products (silver and lead in ingot form) are then brought from the B.C.R. Railway materials, probably for China, represented 23·47 per cent. or the largest tonnage carried during the 1939-40 fiscal year followed by rice with 22·08 per cent., fresh fruit and vegetables 6·95 per cent., paddy 6·59 per cent., timber 5·44 per cent., and stone 5·05 per cent. Other commodities comprise individually less than 5 per cent. of the total. The average freight rate per ton-mile at 7·74 pies (just under ¾d.) was slightly higher than in the previous fiscal year when it was 7·26 pies. There were 18,810,351 passengers carried during the fiscal year 1939-40 compared with 18,920,308 during the preceding year. The falling-off in passenger and goods traffic was due to increasing road competition. Operating revenue amounted to Rs. 37,807,162 during the year under review compared with Rs. 36,051,806 during 1938-39. Other revenue amounted to Rs. 693,806 against Rs. 743,800. Operating expenses totalled Rs. 19,225,724 compared with Rs. 19,117,618. Other expenses were Rs. 7,593,516 for 1939-40 against Rs. 7,458,339 during the previous period. The operating ratio was thus 50·86 per cent.

Transport and the Human Element

HUMANITY in general is capable of remarkable increases in output of energy for a comparatively brief period and in circumstances of special stress, but long experience has shown that if the effort is made for too lengthy a period efficiency declines sharply. In wartime, with the inevitable national requirement of output in excess of available personnel, there is a strong temptation for the Government and other large employers of labour to avail themselves of the human overload capacity without sufficiently counting the cost. In the early months of the present war it would seem that this took place in Germany in connection with the staff of the Reichsbahn, and a series of accidents, which many of the daily newspapers in Great Britain hastily assigned to defects of German railway track and equipment, were shown by us to be probably the result of over-work of the staff—a view which was fully supported subsequently by the texts of various German labour orders requiring reductions in the lengths of duty spells

In Great Britain the "Annual Report of the Chief Inspector of Factories" for the year 1940 says that experience of that year has shown that some valuable lessons of the last war had been widely forgotten or were not yet sufficiently appreciated to provide adequate guidance for the future. This remark was made particularly in reference to the lessons that excessive hours mean less production, and that proper breaks and rest days are of great importance from the production standpoint. Large numbers of factory managements happily do appreciate this, and while they recognise that the sacrifice of an occasional Sunday rest day and the working of very long hours for a short period may be necessary, and indeed result in greater output for the time being, they did not adopt systems of hours which, in the light of experience, are excessive and not calculated to produce the best output. Other managements pay less attention to the lessons of experience or feel constrained to disregard them owing to insistent demands for greater output, and some check by the Government has been found necessary in certain cases.

Employees, too, require some restraint from a tendency to over-work themselves, whether from a desire to earn more wages or from patriotic but misguided motives. In regard to absenteeism it should be recognised that, if persons are expected to work for really excessive hours or without proper intervals for rest and recreation, there will be a reasonable tendency to take time off and stay away for odd days, thus disorganising production. On the other hand, with well-planned schemes of hours and rest days, legitimate grounds for losing time are largely absent. There is probably, therefore, added significance in the fact that on June 7, 1940, the administration of the Factories Act was transferred by a Defence Regulation from the Home Office to the Ministry of Labour & National Service for the period of the war, and the Factory Inspectorate was seconded to the latter department.

The Wootten Firebox

MANY varied factors direct the course of locomotive design on any given railway, and not least among them the nature of the fuel most readily available. This point is brought out in the history of motive power development on the Reading Railroad of the United States, which we review on p. 493. The Philadelphia & Reading Railroad was built in the first instance to serve an anthracite coalfield, and for many decades the problem of its locomotive designers has been to adapt the fireboxes of the engines to the consumption of anthracite, which required firegrates of exceptional size. Ross Winans and Milholland were two designers whose names were prominently associated with these developments, but the finest work was done by John E. Wootten, then General Manager of the Philadelphia & Reading Railroad, who in 1877 patented the firebox that bears his name for burning the waste anthracite or culm that at that time had accumulated in considerable quantities at the pits. A still larger grate was needed than for lump anthracite, so that a thin fire could be maintained with a draught sufficiently light to prevent the fuel from being sucked through the tubes and blown out of the chimney. Wootten therefore mounted his firebox on the frames, and extended it to the full width permitted by the loading gauge; the grate was built up of water tubes and cast-iron bars, and a combustion chamber, separated from the firebox proper by a partition, extended into the boiler barrel. Feed-water heaters were fitted to the first Wootten engines, and the combined economy effected by these and the use of waste anthracite was so great that six years later the 171 engines carrying Wootten fireboxes on the Reading system were effecting an annual economy of $378,000 in fuel. Such was the reputation of the first Wootten 4-6-0s that in 1878 one of them crossed the Atlantic and underwent extensive trials on the French and Italian railways with low grade fuels.

The size of the Wootten firebox was so great that the practice of mounting the driver's cab above the boiler, which had been tried in some of the Ross Winans and Milholland engines, now became permanent, the cab being now moved to a position ahead of the firebox that for the next thirty years or more gave Reading locomotives their curious and characteristic camel-back appearance. The crew were thus separated, the fireman being located at the front end of the tender. Only one Wootten firebox locomotive has been seen in England, and this was the 4-2-2 engine *Lovett Eames*, the 5,000th locomotive built at the Baldwin Locomotive Works,

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which after some running on the Philadelphia & Reading lines came to this country in 1881 to demonstrate the Eames vacuum brake; this had the cab mounted above the firebox, but the latter, though spread across the frames, was not of the true Wootten type, as it was of smaller dimensions and was designed to burn lump anthracite. It is not without significance, however, that the trial running of the *Lovett Eames* took place on the Great Northern Railway, on which, in 1902, Ivatt introduced the first British locomotive type to have a firebox carried above the frames behind the coupled wheels, and spread out to a greater width than the boiler diameter. Although numerous technical references at the time described this as a Wootten firebox, it was not of the true Wootten design, though it is quite probable that Ivatt had the Wootten engines in mind. The same principle has been further developed in the L.N.E.R. and L.M.S.R. Pacifics by Gresley and Stanier, and it is a matter of common observation that these locomotives, with their large and more or less square firegrates, have adapted themselves more readily to the indifferent fuel conditions of wartime than other types with the narrow fireboxes rendered necessary by the 4-6-0 wheel arrangement.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Kiev Suspension Bridge

68, Apsley House, N.W.8
November 7

To the Editor of The Railway Gazette

Sir,—It may be of interest to many who saw in *The Times* of November 5 an illustration showing German engineers building a pontoon bridge "in place of one destroyed . . . in the neighbourhood of Kiev," to know that the damaged structure was a fine suspension bridge built about 1848-1853 by the English railway engineer Charles Blacker Vignoles, by command and under the direction of the reigning Emperor of All the Russias.

Extracts from Vignoles's diary quoted in his Life published in 1889, give vivid details of the almost insurmountable difficulties encountered during the erection of this bridge, disastrous ice floods sweeping away or destroying all the first foundations in 1848 and 1849. However, after endless and vexatious delays due to problems of labour, transport, and epidemics of cholera, the foundation troubles were finally overcome by the use of "fascine mattresses" sunk round the cofferdams, a method much criticised by the Russian experts at the time, but which proved entirely successful, for the diary records that the floods of 1849-50 "fortunately did no harm."

The completed bridge was not actually opened till 1853 by the Emperor's son, the Grand Duke Nicholas, the Emperor, to Vignoles's great disappointment, "having no time"! though he had often visited the work and shown great interest in the progress of the arduous undertaking.

In 1889 the author of the Life remarks that the bridge "still withstands the shock of the ice floods that sweep down upon its piers . . . and though 'built upon the sand' has not yielded one inch."

The journeys to and from England were also full of peril and hardship, and the diary tells how "the boys who occupied the coupé behind, nearly had their feet frozen but the circulation was restored by snow rubbing. It appears they were wearing red Hessian boots and green Hungarian stockings, these being considered by their Austrian advisers to be the most suitable wear for the rigours of the Russian climate! But all went well when the boots were discarded and replaced by warm slippers, with fur bags for the feet and legs!

These "boys" were the assistant engineers, and one of them was my Father.

Two fine and costly models of this bridge were made: one was presented to the Emperor Nicholas I, and the other was exhibited at the Crystal Palace in 1854, where it was destroyed in the great fire of 1866. The cost of the two models was more than £7,000.

Yours faithfully,
THE ENGINEER'S GRAND-DAUGHTER
(Mrs. L. Gordon-Lenox—*née* Vignoles)

"Smoking Prohibited"?

Railway Clerks' Association of Great Britain and Ireland,
Midland Bank Chambers
Howardsgate,
Welwyn Garden City
November 5

To the Editor of The Railway Gazette

Sir,—Smoking in compartments labelled "Smoking Prohibited" or "Non-Smoking" has become so common that I fear the suggestion in your issue of October 17, excellent as it is, would, even if adopted, be of little practical value.

When I was editing the *Railway Service Journal* I received complaints that passengers who found tobacco smoke objectionable or distressing were badly served by the railway companies. I told my complainants that they exaggerated and was promptly urged to "try travelling non-smoker and see for yourself." I did so, and for upwards of twelve months while pursuing my ordinary trade union duties, journeyed some 12 to 15 thousand miles "non-smoker" covering all four main lines and the Underground. I published the results at the time, and candidly they were staggering.

I found that many non-smoking compartments were foul with stale tobacco smoke; that morning after morning the floors of suburban non-smokers were littered with cigarette ends and burnt matches; that a substantial minority of smokers were utterly regardless of the rights of non-smokers and simply could not or would not understand how anybody could be such a fool or a "Cissy" as to find "the fragrant weed" objectionable (women were worse than men); that others took it for granted they had every right to smoke unless somebody objected; that even the average decent fellow would certainly smoke in a "Smoking Prohibited" compartment without compunction if he were alone or shared the compartment with known smokers, and that the staff (officers, stationmasters, ticket inspectors, guards and porters—doubtless all smokers!) for the most part treated the enforcement of the regulations prohibiting smoking in such compartments as none of their business. At any rate, during the whole of that period I never saw one member of the staff (except on the Metropolitan section of the Underground) call upon a smoker to obey the regulations, save on the urgent appeal of myself or other passenger, and even then, at times, especially in dining cars, only with the greatest reluctance.

I found that if I wished to travel in a non-smoky atmosphere I must be constantly objecting; that quite frequently no ordinary remonstrance would suffice, and, in short, that I must be prepared to put up with tobacco smoke or reconcile myself to being treated as a spoil-sport, an interfering busybody, and a regular damned nuisance. Sensitive people, even when greatly distressed by tobacco smoke, are not prepared to face this alternative, and I think the railway companies should see to it that they need not; but certainly something more is needed than a fresh label. The situation is far worse today.

Yours faithfully,
FRED. W. DALLEY

[We comment on this letter at page 490.—Ed. *R.G.*]

Publications Received

A Century of Reading Company Motive Power, 1832-1941. U.S.A.: Reading Company, Reading Terminal, Philadelphia. 9¾ in. × 6¾ in. 108 pp. Illustrated. Paper covers. Price $1.25 post free.—It is characteristic of the growing public interest in American railway affairs that a railway of that country has thought it worth while to compile this comprehensive, accurate, and informative locomotive history. Indeed, with its 130 photographic illustrations, supplemented by line drawings and sketches, its leading dimensions of every Reading locomotive class from 1832 until now, and much relevant descriptive matter concerning past celebrities of the American locomotive world, this compilation presents one of the most complete surveys of American locomotive practice that has yet appeared in print, and its value may be assessed accordingly. Much of the history centres in the use by the Reading of anthracite for fuel, and particularly of waste anthracite; the latter was first made available for locomotive purposes by the introduction in 1877 of the Wootten firebox (which forms the subject of editorial reference on p. 492), and six years later this development was saving the Reading $378,000 annually in its fuel bill. Another point of great interest in Reading history was the inauguration in 1897, with its first Atlantic locomotives, of the 50 min. timing of the Boardwalk Flyer over the 55·5 miles from Camden to Atlantic City, which with a start-to-stop average of 66·6 m.p.h. for many years enabled the Reading to claim the fastest railway schedule in the world.

XUM

THE SCRAP HEAP

A LONDON CABLE TRAMWAY

The New Cable Line of the London Tramways Company was officially inspected by Major-General Hutchinson on December 7, 1892. The length of line converted for cable traction is 5½ miles, and extends from Kennington Park to Streatham Hill and back. The cable, which is 30,000 ft. long, and weighs 30 tons, is enclosed in a tube 17 in. deep and 9 in. wide, the points of the track where the cars cross over the lines at the termini being worked by levers placed on the company's premises. The wheel which conveys the power of the engines to the large pulley which keeps the cable in motion is 30 ft. in diameter, and is driven by 24 hemp ropes. By this means a steady motion is given to the cable, and the noise of ordinary gearing done away with. The machinery and boiler power provided at the depot have been supplied ready to operate 11 miles of track, as an extension is contemplated. —*From "The Railway Engineer" of January*, 1893.

* * *

STANDARD TIME IN 1892

From May 1 next, Greenwich time will be substituted on all the Belgian railways for Brussels time. It has also been decided to adopt a uniform standard of time for all the railways eastward of the French and Belgian frontiers throughout the German and Austro-Hungarian Empires. The time adopted will be exactly an hour earlier than that of Greenwich.—*Extract from "The Railway Times" of January* 9, 1892.

* * *

COBRAS INVADE STATION

Five young cobras enclosed in a large glass jar covered with wire mesh were sent by train to his superior officer in Colombo by a Ceylon Government Railway officer in proof of his complaint that his station premises were infested with cobras. A few days prior to this incident, the same officer had despatched a large cobra, similarly secured, to his superior in Colombo. The Divisional Transportation Superintendent immediately sent it to the museum, and ordered the officer who sent it from a Kelani Valley section station, over 70 miles from Colombo, to pay the cost of transport of the reptile at normal parcel rates. To prove that his wife and children and the station staff were in real danger warranting the action he took, the officer then sent the five small cobras. The Colombo station parcels office, where the jar of cobras was kept for some time, attracted many visitors; ultimately the five young cobras were also despatched to the museum.

* * *

RAILWAY DOGS

The Great Western Railway Company has twenty-five sheepdogs on its pay-sheets in Wales at places where sheep often break through the fences, not only endangering their lives but delaying the progress of trains. The dogs, working without orders, find obscure openings in fences through which to shepherd the flock back. They learn to develop "line sense": if they are caught between trains on adjacent lines they lie down until both have passed. If maintenance men, working on the line, do not heed the noise of an oncoming train the dogs bark at them and refuse to leave until the last workman is out of the way.—*From "The Manchester Guardian."*

* * *

A woman recently asked at a Maidstone booking office if they "still did day trips to Boulogne."—*From the "Southern Railway Magazine."*

* * *

Jews in Berlin are now prohibited from sitting in tramcars or trains if Aryans are standing, according to a press message from Gothenburg.

* * *

The warning voice saying "stand clear of the gates" at the Earl's Court station lifts, London Transport, was replaced on October 13 by a chime of bells.

* * *

V

A large red, white, and blue victory emblem was placed recently on the front of the streamline Flying Yankee train of the Boston & Maine and the Maine Central Railroads.

* * *

VICTORY ENGINE

One of the most novel forms of the victory sign came to my notice the other day at Rock Ferry station (writes a correspondent to *The Liverpool Daily Post*). An express railway engine arriving there bore on its side the familiar letters in gold, L.M.S. The middle strokes of the M had been thickened and enlarged with a fresh coat of paint, so that it showed up as a brilliant V.

* * *

The Chancellor of the Exchequer stated in the House of Commons on October 22 that Mr. Charles Dickens, of Great Brickhill, North Buckinghamshire, who at Bletchley recently unearthed a number of gold and silver coins, had received the net value of the coins, £607 17s. 1d. The gold coins were claimed by the Treasury under the Defence (Finance) Regulations; the silver coins and also a watch and chain found at the same time were offered to the British Museum, but were not required by that institution and they had been returned to Mr. Dickens. These arrangements, said the Chancellor, were in accordance with the general practice for dealing with treasure trove.

* * *

HUSTLE

"It is reliably learned in Washington on October 29 that the United States would send a military mission to Irak to study the feasibility of constructing the unfinished link in the historic Berlin-Bagdad railway as a route for war supplies to Russia. The mission would investigate Britain's proposal for spanning the 100-mile gap in the Irak railway to link up the Persian Gulf with the Turkish railway system, which has direct connections with the Soviet railways east of the Black Sea.—A.P."—*From the "Evening News."*

The last section of the Baghdad Railway was that between Quayarah and Mosul, and it was brought into public service on July 17, 1940.

SMILING THROUGH . . . *By LEE*

[No. 2,212] LEARNERS

"Yes, the girls are doing pretty well, but of course they haven't quite developed the really ruthless platform technique yet."

From the "Evening News"

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

AUSTRALIA

Additional Melbourne-Sydney-Melbourne Services

The popular Albury express leaving Melbourne daily (Sundays included) at 4.50 p.m. has for some months past been carrying heavy loads of passengers, and, in consequence, has frequently had difficulty in maintaining its schedule. To relieve the situation, a new express was put on as from July 7, leaving Spencer Street station at 6.40 p.m., 10 min. behind the non-stop Spirit of Progress, and running six days a week. It stops only at Benalla and Wangaratta, and connects at Albury with a new train leaving for Sydney at 11.20 p.m.; Sydney is reached at 10.35 a.m. Simultaneously, the Albury express was altered to leave Melbourne at 4.45 p.m.

The corresponding new train in the opposite direction leaves Sydney, with sitting passengers, at 7.35 p.m., and connects with the V.G.R. train leaving Albury at 6.50 a.m., Melbourne being reached at 11.5 a.m., 25 min. ahead of the Spirit of Progress.

The Spirit of Progress now leaves Albury for Melbourne 5 min. earlier, namely, at 7.50 a.m., but still arrives at Spencer Street at 11.30 a.m. The second division leaving Albury on Sundays at 8.10 a.m., is now booked out at 8.20 a.m. and reaches Melbourne at 1 p.m.

On the Sydney-Albury section there is also a new day train each way, leaving Sydney at 9.25 a.m. and Albury at 8.42 a.m., the arrival time at both destinations being 7.20 p.m.

VICTORIA

Locomotive and Rolling Stock Notes

The locomotive and rolling stock building programme of the Government Railways for 1941-42 includes 20 more "K" class 2-8-0 engines, 10 more "X" class 2-8-2 engines and 400 20-ton "GY" trucks. No. 169 a new "K" class has now been turned out, as also have 20 new four-wheel "Z" vans; a further 20 are building. No. 220H, the new 4-8-4 locomotive, has completed her 18,000-mile "D" trials with credit to all concerned. She is now permitted to run through to Albury with speed restrictions of 10 m.p.h. over the Murray bridge and of 20 m.p.h. between Wodonga and Albury.

New Track Block Working at Geelong

On June 22 track block signalling (track-circuit-controlled signalling) was brought into use between North Geelong A box and Geelong in place of the ordinary double-line block telegraph system.

SOUTH AUSTRALIA

Locomotive and Rolling Stock Building Programme

Probably the most interesting item in the 5 ft. 3 in.-gauge locomotive building programme of the Government Railways is two diesel-electric locomotives. Ten steam locomotives are to be constructed, some of them Mikados (2-8-2's) and some of a new design of medium size Mountain (4-8-2) type. Other items are 24 new passenger cars, 50 open bogie 40-ton trucks, and 100 four-wheel louvre trucks. For the narrow gauge system, 15 31-ton open trucks, 30 sheep vans and 10 cattle vans are to be built.

CHINA

New Railway Extension

The branch line from Hsinsiang to Chinghua (Tsingh Wachen) has been extended 18 km. to Tsinyang. Hsinsiang is on the Peking-Hankow Railway just north of Chenchow, all the places mentioned being in the extreme north of Honan Province.

JAPAN

Coaching Traffic Congestion

To alleviate the congestion prevailing on the Government Railways and save labour, the Ministry of Railways has decided to discontinue collection and delivery of passenger luggage. For the same reasons bulky and luxury articles will not in future be accepted at the baggage forwarding offices for despatch by passenger train; they will have to be sent by goods train.

Widespread Damage by Cloudburst

As a result of the worst rainstorm or cloudburst in western Japan for over 50 years, at least 52 people lost their lives, 12,000 houses were flooded and 144 roads seriously damaged. On the railways train service was paralysed and many breaches of the formation and track were caused. The main Tokaido line between Kyoto and Osaka was impassable, and remained so for a long period.

UNITED STATES

New Stock in Service and on Order

During the first eight months of 1941, Class I railways placed in service 84 steam and 288 electric or diesel locomotives, 25,785 box, 20,359 coal, 1,458 flat, 1,218 refrigerator, 50 livestock, and 264 miscellaneous cars. On September 1 they also had 317 steam and 294 diesel or electric locomotives and 92,033 freight cars of various kinds on order, as compared with only 18,456 cars on order on September 1, 1940.

MEXICO

New Rolling Stock

During 1940 the following railway equipment was imported from the United States:—

15 locomotives and parts.
177 railcars and spare parts.
408 goods wagons, wheels, axles and other spares.
42 mine tubs.

It is also announced locally that 40 more locomotives and 1,000 steel box wagons are to be ordered, presumably from the U.S.A.

BELGIUM

Transport Co-ordination

According to an announcement published in the *Gazette* the Ministry of National Economy has established an organisation to be known as "Main Group Transport." This "group" is intended to be the principal exponent of the country's undertakings dealing with transport in all its forms, namely, on land, water, and in the air, both of goods and passengers. All shipping firms, port enterprises, tug contractors, shipping brokers, transport arbitrators, shipping experts, independent shippers, organisations of stevedores, discharging and loading contractors, etc., of both maritime and inland shipping have been requested to join the new organisation, as well as railway companies, including the Société Nationale, owners of storage spaces, forwarding agents, road traffic firms, and others.

SLOVAKIA

Three Countries Purchase Bohumin-Kočise Railway

[In the closing paragraph of an article entitled "The Railways of Slovakia" on page 304 in our issue of September 26 last, reference was made to the negotiations between the Bohumin-Kočise (Kassa) Railway Company and the three countries—the Protectorate of Bohemia & Moravia, Slovakia, and Hungary—in which parts of the railway are situated, with a view to the State Railways of those territories taking over the system piecemeal—ED., *R.G.*]. It is now learnt that the agreement reached became operative on August 20, but the percentages of the share capital, Kr. Czechoslovak 45,280,000, finally agreed upon between the parties concerned differ somewhat from those foreshadowed previously. They are Slovakia 69·625 per cent., Germany (on behalf of the protectorate) 25 per cent., and Hungary 5·375 per cent. Assets and liabilities were taken over in the same proportions. Unredeemed debentures are said to be mostly in German hands and payment on that account will be in cash.

SWEDEN

Private Railways' Financial Results for the First Half of 1941

Although the privately-owned railways were able to increase their receipts in the first six months of 1941 as compared with those for the same period of 1940, the net profit shows a slight decrease from Kr.6,440,000 to Kr.6,380,000. The following are particulars relating to the private railways for the two periods under review. It may be pointed out that the figures shown for the first half year 1940 refer only to the railways under private management in the first half of 1941 and are therefore at variance with the figures published last year for the period ended June 30, 1940; a considerable number of private railways were incorporated in the State system as from July 1, 1940:—

	First six months 1940	1941
	Million kronor	
Total receipts from railway operation only	61·65	69·91
Expenditure	45·95	52·58
Net earnings	15·70	17·33
Allocation to Renewal Fund	4·33	4·74
Interest	2·80	2·66
Taxation	1·91	3·33
Miscellaneous expenses ...	0·22	0·22
Net profit from railway operation only	6·44	6·38

CEYLON

Railway Reduced to Borrowing Steamer Company's Coal

So precarious has the locomotive coal situation become, that a considerable quantity of coal belonging to a big shipping firm and stored in Colombo is to be loaned for the use of the railway at the request of the Government. When the consignments of coal ordered by the railway from India arrive, the quantity that is borrowed will be returned to the company concerned. These cargoes ordered by the railway are expected to arrive shortly, although they have been subject to delay owing to shipping difficulties.

XUM

SOUTH AFRICAN RAILWAYS & HARBOURS CENTRAL TRAINING INSTITUTE

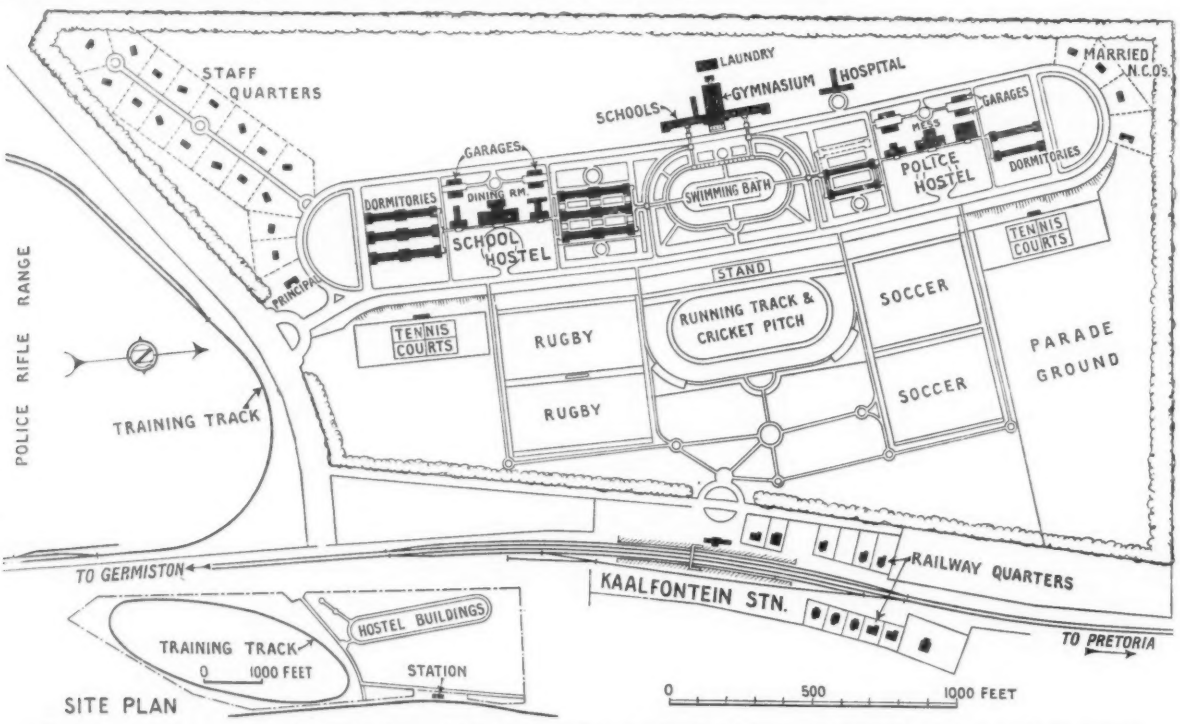
A description of this most up-to-date establishment, which includes a two-mile oval 3-ft. 6-in. gauge demonstration track completely equipped in all respects

THE establishment by the South African Railways of a central training institute for the technical instruction of railway personnel is the outcome of a recommendation of the Staff Training Committee, appointed in 1938, under the Chairmanship of Mr. C. M. Hoffe, the present General Manager. The scheme envisages the erection of carefully designed buildings for instructional and residential purposes on a site of at least 50 acres. Training will be under expert instructors recruited from the administration's most experienced personnel. Both theoretical and practical instruction will be given in such subjects as trains-operation, signalling in all forms, station foreman's duties, platelaying, and permanent way maintenance. By a gradual process of elimination the most able candidates will be selected for the institute, where the instruction afforded will enable them to attain a high degree of efficiency. Up-to-date and comprehensive equipment is to be provided, including a large oval 3 ft. 6 in. gauge track of 60-lb. rails complete with signalling systems, engines, rolling stock, telegraph instruments, telephones, etc.; the track-mileage in this demonstration railway, as projected, exceeds two miles; the route-mileage measures about 10,000 ft.

The site chosen for the institute is at Kaalfontein about midway between Johannesburg and Pretoria. As will be seen from the site plan, the scheme is divided into two parts, comprising one group of buildings for railway students and one group for railway police recruits. The group for railway students will consist of a central block containing a large entrance hall opening into an assembly hall which will be equipped with stage and dressing rooms and will accommodate 500 persons. It will have sufficient floor-space for two Badminton courts and a gymnastic class of 100. Adjoining the hall as part of the same unit is the school for railway students in a double-storey wing on the south, and on the north is another double-storey wing containing a railway museum on the ground floor and a school for police recruits on the first floor. The entrance hall to this block will provide access to the museum and will be used for the display of exhibits. The central block faces east, overlooking the garden lay-out which includes a regulation size recessed swimming bath surrounded by stepped grass terraces. South of the central block is a hostel group for railway students; this group contains a dining hall block to accommodate 500 students. On one side of the dining hall there will be a recreation wing and on the other a reading room and library. On the north and south of the dining hall block there will be six double-storey dormitory units, each to accommodate 88 students.

The police hostel group will have a central mess block flanked on the south by a recreation and dry-canteen block and on the north by an administrative block. There will be three dormitory units and a block containing a study, reading room, and lounge. A circular training track will be provided with a police rifle range in its centre. All the blocks in the scheme will be linked together by a covered-in colonnade and will present a group of buildings with a total frontage of 2,550 ft.

The administration is proceeding with the establishment of the institute as quickly as present circumstances will permit; the whole of the site, 7,600 ft. long by 1,800 ft. deep, has been fenced. A special feature of the layout is the extensive planting of trees representative of all parts of South Africa, much of which has been completed. The institute is estimated to cost at least £150,000 and will be completed in about eighteen months.



Site plan of the central training institute which is planned by the South African Railways & Harbours administration for the technical instruction of railway personnel

UNIT BEARING PRESSURES FOR LOCOMOTIVE DETAILS

A proposed basis for the elaboration of this important but somewhat neglected subject

By GEORGE W. McARD

AVAILABLE information on the subject of bearing pressures and the limits recommended for various components incorporated in the design of locomotives is very scanty; yet the subject is one of vital importance, and the writer offers the following notes in the hope of providing at least a basis on which it may be elaborated. Only the smallest attention has been focused hitherto upon the question of the load on bogie pivots, excluding in this connection the Garratt engine, in which the truck centre is of a patented design. The shape of this detail varies very considerably; in some instances the load comes directly on to a flat surface, circular in plan, and of substantial area, while in others it takes the saucer shape, and in the latter design the saucer may have its concave side normal or inverted. Then again, the pivot may be employed merely as the instrument for guiding the vehicle along the track without taking any weight, the actual load of the superstructure being sustained by side bearers which serve also as steadying brackets. Whatever the method adopted, the load must be carried, and unless the unit pressure is sufficiently low, excessive wear will be inevitable. Until comparatively recent times, the surfaces in contact were frequently without any really satisfactory scheme of lubrication, and the wear was therefore very considerable. For modern locomotives, grease lubrication is available, and, by means of suitably planned equipment, all vital parts can be easily and efficiently greased at specified periods.

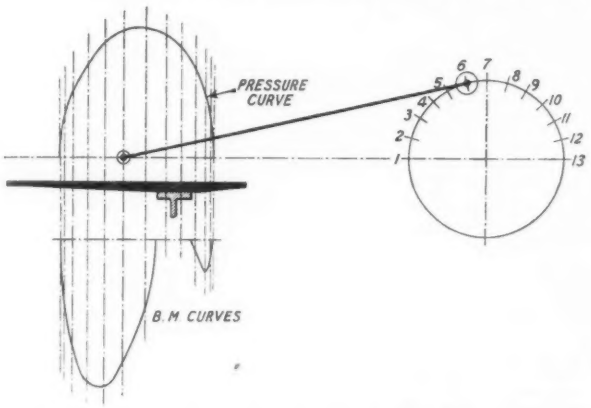


Fig. 1—Pressure or load curves and bending moment for outside cylinder slidebar

The following values have been obtained from a considerable number of vehicles, locomotives and railcars, and satisfactory service has been given in all the cases examined.

Bogie flat bearings	300–350 lb. per sq. in.
,, saucer ,, ...	280–300 ,, ,,
Flat side bearers for bogie or truck-weight carrying...	350 ,, ,,

The unit pressure given in many engineering textbooks as a maximum to be worked to for crosshead shoes, or slides, is 80 lb. per sq. in., but for outside cylinders of locomotives this figure is much too high, 50 lb. being a safer value. A factor that needs to be reckoned with is the effect of the dust and grit which cannot be entirely excluded however good the protection afforded may be, and while such safeguarding is often found only on first class locomotive stock, in the writer's opinion it should be provided for all outside cylinders, as very much grit is produced during braking operations, the resulting powder, of almost entirely metallic composition, acting as an abrasive of the worst kind. For inside cylinders 80 lb. per sq. in. is quite a satisfactory figure to work to, an average taken over six first class engines operating on different systems being 78·4 lb. The thrust is, of course, nil at each end of the stroke, rising to a maximum at a point in the vicinity of mid-stroke, and Fig. 1 shows the pressure or load curve and the bending moment diagram for the outside cylinder slidebars of some express passenger engines built for the Central Argentine Railway.

Many different values have been quoted for axlebox bearing pressures, but the table below shows pressures that are today giving good results on locomotives in various parts of the world. The risk of hot boxes, with consequent traffic delays, is too serious to justify a cheeseparing attitude in any designer. Coupled axleboxes are naturally in a category of their own, as, through them, the entire engine power—booster engines excluded—is transmitted to the vehicle and the train.

		American practice lb. per sq. in.	British practice lb. per sq. in.
Passenger engines ...	Leading bogie	160	150
	Coupled	175	180
	Trailing truck	160	170
	Tender	300	250
Freight engines ...	Leading bogie	180	150
	Coupled—trailing excepted	200	180
	,, trailing	185	180
	Trailing truck	180	170
	Tender	325	250
Shunting engines ...	Coupled	200	224

Although the same unit bearing pressure is applicable to all coupled axleboxes in British practice, not infrequently the driving journals may necessitate larger diameter bearings than those required for the remaining coupled axles on account of the greater stresses to which the driving axle is subjected. The result will be an appreciably lower unit bearing load, due partly to the factor just mentioned, and

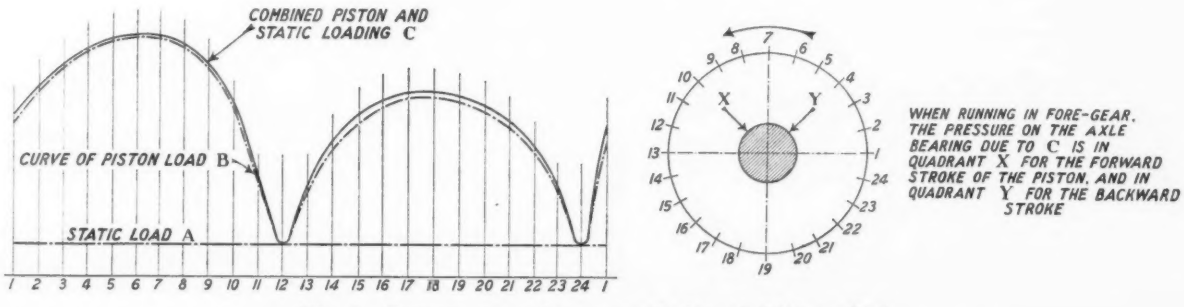

COMBINED PISTON AND STATIC LOADING C
CURVE OF PISTON LOAD B
STATIC LOAD A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 1
X
Y
WHEN RUNNING IN FORE-GEAR, THE PRESSURE ON THE AXLE BEARING DUE TO C IS IN QUADRANT X FOR THE FORWARD STROKE OF THE PISTON, AND IN QUADRANT Y FOR THE BACKWARD STROKE

Fig. 2—Pressure curve for one revolution of driving wheel

XUM

partly to the lower springborne load carried on the driving springs, where the rail weights are common for all coupled wheels.

It is not altogether correct to take account of the static loading only, ignoring the load due to the steam action in the cylinders, in calculations of bearing pressure on coupled axle journals. Fig. 2 shows a pressure curve for one revolution of the driving wheel of an engine having two outside cylinders, 19 in. diam. by 26 in. stroke, coupled wheels 6 ft. 2½ in. diam. and a boiler pressure of 225 lb. per sq. in. The gross load at the rail is 18 tons and the net load on each bearing 6½ tons, the journals being 9¼ in. diam. by 10 in. long. The curve A is for the bearing load—in lb. per sq. in.—which is virtually constant throughout the revolution and acts vertically downward. Curve B represents the horizontal load due to the steam pressure, and when running in foregear this acts on the front of the journal as the piston progresses from the back dead centre and to the rear of the journal on the return stroke. Curve C is the combined loading obtained by the formula $C = \sqrt{A^2 + B^2}$, A and B being the values of the two first named graphs for any selected position in the crank's rotation.

While on the subject of axle bearing pressures it is usual and advisable to compare figures for new designs with known values for similar engines which are giving good service. A formula employed by certain authorities is TWV/dl, where

T = the tractive force developed at 30 per cent. of the boiler pressure, and spread over the number of journals in the coupled wheel group.
W = coupled wheel diameter in inches at the tread.
V = peripheral speed of journal surface in feet per second at 250 r.p.m.
d = diam. of journal in decimals of a foot.
l = length " " "

Six first class examples give values of 2,030, 1,600, 1,585, 1,830, 1,930 and 1,800, which would suggest a good approximation around 1,800 as a base value for comparison.

One further point of interest may be mentioned before leaving the subject of axle journal pressures. When a new freight engine is in process of design, where the rear axle is one of the coupled group, *i.e.* no trailing truck being included, good practice will distribute the weight over the coupled axles in such manner as will ensure the rear axle sustaining a slightly lower spring load than the others, in order to provide for the increase in load which comes on these springs and bearings when hauling a heavy train at slow speeds.

While on the subject of axlebox bearing pressures, the further problem of vertical guide, or hornblock, surfaces should receive consideration, although the writer is unaware of any unit bearing pressure having appeared at any time in any locomotive specification. The surfaces under load for the driving axle can be related to the maximum piston load and, from a number of first class engines taken as examples, the unit pressure varies between 600 and 700 lb. per sq. in. To obtain the maximum load, the formula adopted for a locomotive with two outside cylinders is $P(M + N)/2M$, where

P = maximum steam thrust on one piston with crank on dead centre.
M = transverse centres of axle bearings in inches.
N = " " outside cylinders in inches.

An interesting question is raised occasionally as to the correct position of the axlebox guide adjustable wedge, and this may be considered from a twofold aspect, *i.e.* steam action and, alternatively, brake pressure. On an express engine with tender, where high-speed running is almost invariably done with the front end leading, the front axlebox guide faces will be subjected to the greatest loading and consequently the greatest wear; it is therefore logical to place the renewable wedge at this point. When considered in relation to the brake gear, the correct position would appear to be on the opposite side of the wheel centre to that in which the brake block is situated, as extra wear is bound to occur on that guide face owing to the increased loading during braking. For this reason some engineers specify a liner on one face and a wedge on the opposite side.

The allowable pressures on coupling and connecting rod brasses and bushes are usually as given below, although slight variation in these values will occur as the result of duplicating details which are common to other locomotive stock on the same railway system:—

Outside connecting rods, big end	—1,500	lb.	per sq. in.
Inside " "	—1,400	"	"
Connecting rod small ends (outside and inside)	—4,200	"	"

Coupling rod bearing pressures should be treated as being in the same class as outside connecting rods and the knuckle joint pin permissible load may be taken as 4,500 lb. per sq. in.

Details that are very vital to the efficient and continuous running of the engine are the joint pins in the valve gear, and the importance of ample wearing surface for these parts cannot be overstressed. No unit bearing pressures can be considered for reasons that will be fairly obvious, but experience shows that the diameter of the pin in the wearing portion should be approximately one-tenth the cylinder diameter, working to the nearest ⅛ in. and taking the next size above the decimal resulting from the value given. Thus an engine with 20 in. cylinders should have 2 in. diameter pins, and one with 18 in. cylinders would have 1⅞ in. diameter pins.

Brake blocks are subject to more or less frequent renewal according to the service being operated, and the area of the surface of the block which is offered to the wheel will materially determine the life of the block and the frequency of its renewal. It would, therefore, seem desirable to have a maximum bearing surface pressure per unit of area, assuming the same grade of iron to be used generally for these details. After an investigation covering a number of brake blocks taken from engines known to be successful, the writer could not arrive at any suitable value owing to the big variation obtained, but would suggest that a basis for this is certainly desirable, while recognising the common practice prevailing on railways and in private building establishments of using the most suitable patterns available. On several occasions in his own experience, he has found this practice responsible for trouble in the life of the engine, blocks having to be changed at too frequent intervals.

The bearing pressures to which joint pins for brake and spring gear are subjected can be found in relation to the shear stress allowable and, although certain figures have been published as maximum pressures for the designer to work to, the former is decidedly the method to be preferred. Assume f_s as the shear stress permissible and the area available when in double shear to be 1·75 times that for single shear. The total load on the pin may then be

$$0{\cdot}7854d^2 \times 1{\cdot}75 = f_s$$
$$= 1{\cdot}37d^2f_s \text{ (where "} d \text{" is the pin diameter).}$$

If the pin has a square bearing, *i.e.* one in which the diameter and length of the pin under load are equal, the bearing area equals d^2 and the unit bearing pressure will equal $1{\cdot}37d^2f_s/d^2$, or $1{\cdot}37f_s$, which gives a satisfactory base upon which all such pins can be tested.

Successful Use of Roller Bearings on Locomotives.—Mr. O. A. Garber, Chief Mechanical Officer of the Missouri Pacific Railroad, recently stated that the fitting throughout of roller bearings on the company's locomotives had greatly increased their mileage. He mentioned seven which received roller bearings to all wheels early in 1940. Up to April, 1941, these seven had run 1,653,346 miles, compared with 511,271 miles during the corresponding period before they were so equipped. Another four locomotives similarly equipped late in 1940, had at the end of last April accumulated 139,853 miles, or almost double the 71,246 miles recorded during a comparable period with plain bearings. Four Pacific type express locomotives completely equipped with roller bearings last year, at the end of April had accumulated 441,566 miles, as against 269,847 miles of operation during comparable periods without these bearings. While these figures constitute a striking tribute to the efficacy of roller bearings, some of the improvement in performance must be attributed to extensive modernisation of the engines at the same time.

ELECTRIC TRACTION SECTION

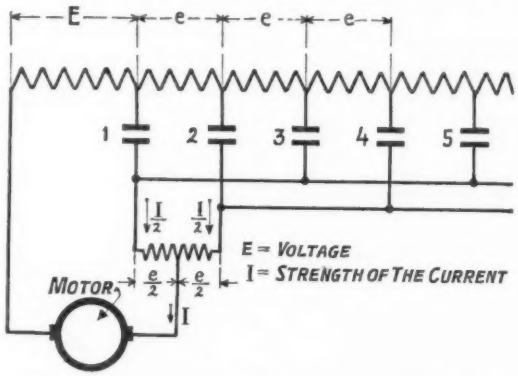
SINGLE-PHASE TRACTION MOTORS

A resumé of some characteristics and progress within recent years, with special reference to European practice

(By a Continental Correspondent)

TO be suitable for traction purposes a motor must work faultlessly over wide limits of speed with good efficiency. It must have a large starting torque to produce the high tractive effort desirable when running at low speed, and the motor speed must be reduced automatically as the tractive effort required increases; in this way the peak loads can be reduced. The d.c. series motor has all these characteristics, but in the early days of electric traction there were difficulties in constructing a single-phase a.c. motor with equally good qualities. These difficulties have been overcome, and the modern a.c. commutator motor has all the good traction qualities of the d.c. type.

The direction of the torque of the d.c. motor does not alter when the direction of the rotor current and the polarity of the stator are altered at the same moment, hence if a d.c. series motor is run by alternating current, pulsating torques arise, which always have the same direction. On the other hand, although the d.c. series motor is in principle suited for running with a.c., the following troubles would be encountered if it were so run: excessive heating of the solid pole cores by eddy currents, and thereby a reduction in the torque; decrease of the driving field by magnetic reaction of the eddy currents, and in consequence a great decrease in the



Illustrating the use of a choking coil between control notches of a single-phase commutator motor

torque; a bad power factor, *i.e.* a heavy reactive current which would do no work but would be the cause of additional losses; severe heating of the commutator and brushes; and heavy sparking at the brushes. The first two difficulties, caused by the eddy currents in the stator, can be eliminated easily. The stator of an a.c. motor is not made with solid cores, but is built up of thin steel plates insulated from one another by lacquer or paper.

To improve the power factor a less powerful driving field is provided, but the rotor has more ampere turns than has a d.c. motor. In addition, a compensating winding in the stator, a smaller air gap, and half-open slots are used. To avoid the bad influence of the rotor field it is counterbalanced by a compensating winding which is equally distributed in the stator.

Low frequency, a small pole-field, a small number of short-circuited windings, and other means are used to overcome starting difficulties, which arise because the coil which is short-circuited by the brushes is situated between the main poles, and is penetrated by the whole field of one pair of poles. As this field periodically changes its direction, it induces an electromagnetic force in the short-circuited coil; this electromagnetic force produces an alternating current through the short-circuited coil, which current is limited only by the contact resistance and internal resistance of the brushes. If this additional current is not restricted, it may, in starting, heat the brushes even to red heat, and may also damage the commutator. The pernicious electromotive force induced by the driving field in the short-circuited coils is in proportion to the square of the frequency of the driving field: to the total number of turns in the short-circuited coil; and to the magnitude of the field of the main poles. Each of these three items must be kept as small as possible in the design of an a.c. motor suitable for traction purposes.

Railways in Central Europe and in Scandinavia have single-phase traction systems with a frequency of 16·7 cycles. The lower the frequency the better are the starting conditions, commutation, and power factor, and the lower the voltage drop on the contact lines. On the other hand, a low frequency increases the difficulties associated with the transformer and power plant design. The frequency of 16·7 cycles was therefore chosen as a compromise.

To prevent the e.m.f. produced by transformer action from becoming too high, the field belonging to each pole must not exceed a certain limit, and this is of great importance in the design of the motor. In order to decrease the number of turns short-circuited at any one time and connected in series, the rotor winding of a.c. traction motors is designed as a bar winding, with only one turn per coil.

Another way of reducing the transformer effect is to shunt the winding of the commutating pole by a non-inductive resistance, the combination being connected in series with the rotor. Although the pole field is limited, the initial torque is sufficient to make use of the whole adhesion weight of the locomotive when starting. The rotor voltage which may be attained is normally from 400 to 600 volts. This permits of economic design of the control gear for large outputs.

A tendency during the last few years has been to raise the output of the motors by improving the electromagnetic efficiency of the rotor, and by raising the rotational speed of the rotor and commutator. Diminution of the additional losses in the rotor by subdividing the commutators, and an improvement in the cooling, has made it possible to increase the current intensity considerably, and thus the output of the motor. In practice, all this means that a better use of the constructional materials has increased the output, and the weight and price of motors per unit of output have been appreciably reduced.

If one compares an a.c. motor with a d.c. model of the same output and r.p.m.—and thus with the same torque—it is seen that as the whole driving field of the a.c. motor must be kept weaker, a greater current must traverse the rotor. Therefore, the a.c. motor is lighter as regards iron and heavier on copper, and the diameters of the rotor and commutator are greater than with the d.c. motor. The commutator of the a.c. motor is longer, and is often subdivided. The a.c. motor has the merit of giving the usual output at much higher turning speeds than the d.c. motor, on account of the excellent regulation of the voltage.

When an a.c. motor is compared with a d.c. motor in relation to the same traction programme, it is found that the weight of the rotating parts of the a.c. motor is the greater, but that the weight of the stator is smaller. The total weight

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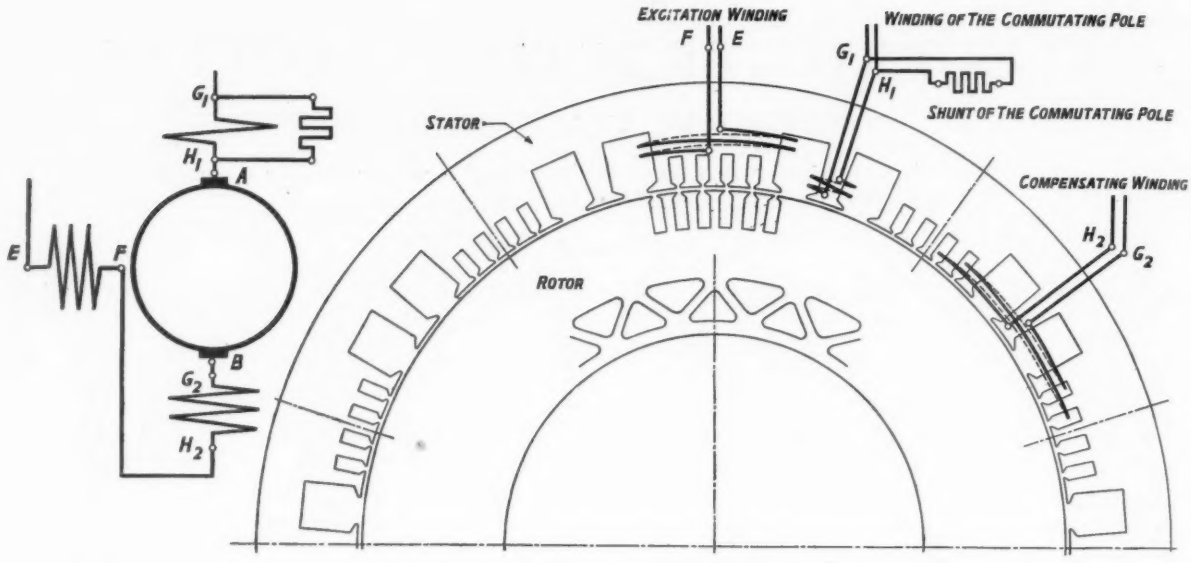


Diagram of 560 kW single phase traction motor

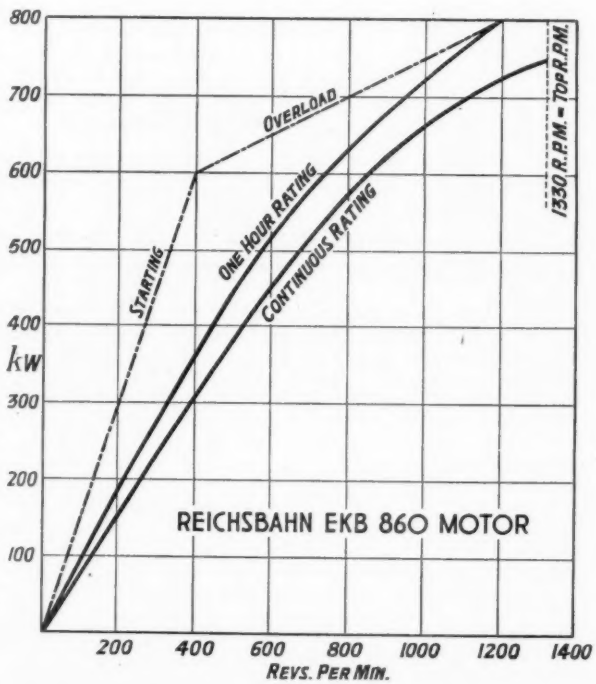
and the overall dimensions are about the same, but the a.c. motor is more expensive, due to the greater copper content, and to the construction of the stator requiring more work.

As to the control of an a.c. motor, the speed is altered by changing the motor voltage. The contact line voltage in European single-phase systems is usually about 15 kV, and this is reduced in the locomotive or motor-coach by means of a step transformer to the voltage best suited to the motor. On starting, the motor is connected to the lowest voltage step at 80-90 volts without the insertion of any series resistance. This voltage is then raised in 15 to 25 steps to the highest value of anything between 400 and 600 volts. To avoid interruption in output when switching from one step to another, without short-circuiting a step of the transfomer, a choking coil is used, as shown in one of the accompanying illustrations. On the first step the switches 1 and 2 are closed; when switching to the second step switch 1 is opened and immediately afterwards switch 3 is closed, and so on. This system of control avoids losses on all steps. In contrast to the d.c. motor, all steps for traction purposes can be used in the same way.

For such systems of control, relays are generally used as switches, and are controlled electromagnetically, electro-pneumatically, or mechanically by cam gear. When moving from one switching step to another, a further device called the precise or fine-notch regulator (*Feinregler*) is also used, and consists principally of a species of commutator with brushes rotating during the switching period, and an additional transformer. Another type of control is formed by connecting the motors permanently to the low-voltage side, and controlling them on the high-voltage side of the transformer inside the oil tank.

Apart from shunting locomotives, one big motor driving a number of coupled axles is rarely adopted nowadays for new construction. In most examples the axles are not coupled, but each is driven by a separate motor. In locomotives of low-speed and medium-speed types the single-phase motor is now generally of the nose-suspended type, but on higher speed classes an individual axle drive comprising a quill and a spring or joint coupling is the most usual arrangement. With such drives it is most important that all the motors are connected in parallel on all steps and when starting. Thus when a pair of wheels slip it does not influence the tractive effort at the other wheels. With d.c. traction the starting must be done with motors in series; if individual axle drive is used and a pair of wheels slip, the amperage of the whole circuit falls in consequence of the higher r.p.m. of this one motor, and all the others lose some of their torque. Thus it is possible to haul with a.c. locomotives, especially on steeply-graded routes, higher train loads than with d.c. locomotives having the same adhesion weight.

Among specific motors, one of the standards of the Reichsbahn may be mentioned. Designed for application, with suitable gears, to either passenger or freight locomotives, it has a one-hour rating of 560 kW. It was developed out of a 300-kW type built at one of the Siemens-Schückert works for use in modern Bo-Bo locomotives. This motor is claimed to have excellent commutation at starting and when running, owing to large air gaps next to the main poles and commutating poles. With four motors of this type a double-bogie locomotive is able to start a trailing load of



Characteristic curves of Reichsbahn single-phase motor

338 tons on a 1 in 40 grade and haul it uphill at a speed of 35 to 40 m.p.h. The motor case is welded of steel plate in the form of a cylinder, with ribs to contain the portions of the stator and with flanges for the bearing brackets. Each motor is ventilated with two cub. m. of air per sec., and for each pair of motors there is one ventilating set. The stator has ten poles; the exciting windings and those of the commutation poles are connected in parallel and the compensating windings in series. The brush yoke can be rotated in the case and can be exactly aligned by adjustable bolts. The motors work with gears on each end of the quill, which drives the axle through a spring coupling similar in principle to the Sécheron and Westinghouse drives. In service the wear of the carbon brushes does not exceed 0·1 mm. per 1,000 locomotive-km. Working heavy freight traffic on steeply-graded lines, some of the above-mentioned double-bogie locomotives with these motors run 160,000 miles between commutator re-turning. A motor complete, but without the driving gears or ventilating set, weighs 3,330 kg., or 5·95 kg. per kW on the one-hour rating.

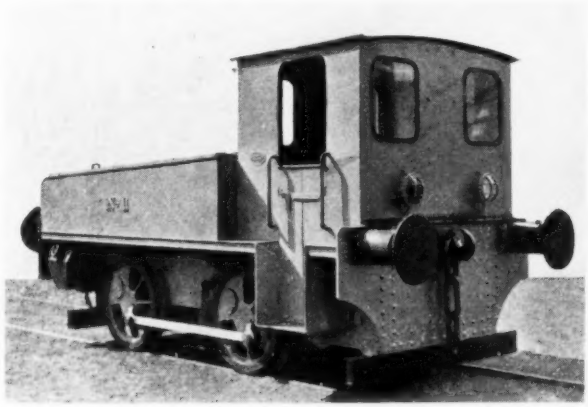
Another motor of some interest is the EKB860 standard of the Reichsbahn, which has a one-hour rating of 800 kW. Designed by the A.E.G. for use in express electric locomotives, it was installed first in 1933 in some 1-Co-1 locomotives, and later, with several improvements, in the numerous 1-Do-1 express locomotives of Series E.18. The motor was designed particularly to give a high tractive effort when running at great speed, and therefore is able to accelerate heavy express trains quickly up to the top running speed, and also to run uphill at a relatively considerable speed. The locomotives of Series E.18 can haul trains of 600 tons weight up long 1 in 100 grades at a speed of 75 m.p.h. The casing of the motor is made in one piece of cast steel, and in its lower part has two plain bearings cast on for the hollow shaft of the individual axle drive. The stator and rotor have separate ventilating circuits, but each is supplied from the same blower. Torque is transmitted to the driving wheels by means of the A.E.G.-Kleinow drive. The stator has 12 main poles, and its windings are carried in half-open slots and fixed by wooden wedges. All 12 poles are connected in parallel. The windings of the rotor have a diameter of 860 mm. and are insulated with mica. The peripheral speed of the commutator is 43 metres a second when the locomotive is running at a track speed of 88 m.p.h. The wear of the carbon brushes is stated to be a maximum of 0·2 mm. per 1,000 locomotive-km., and the mileage between commutator re-turnings when operating in express passenger service is 155,000. Without driving gears or ventilating set the motor weighs 4,900 kg., equivalent to 6·1 kg. per kW on the one-hour rating.

Battery Locomotive for Industrial Haulage

Immediate availability, quietness of operation, and absence of exhaust are features

THE British Thomson-Houston Co. Ltd. has recently supplied and put into regular industrial service an 0-4-0 standard-gauge battery locomotive to replace a diesel locomotive previously employed, in a temporary capacity, for the performance of similar duties. The immediate availability for service calls, the silence of operation, and the complete absence of all stand-by losses, are important features in this particular application.

The drive is by a single traction motor geared to one of the two coupled driving axles, the wheelbase of which is 5 ft. 3 in., so enabling sharp curves to be taken easily. The armature



A B.T.H. battery shunting locomotive

has roller bearings, and a common oil well feeds both suspension bearings, thus reducing lubricating maintenance to the minimum. Axlebox oil wells and side rod bushes are accessible from outside the locomotive.

The motor is rated at 20 h.p. on 150-200 volts, and is operated from a 380 amp.-hr. N.I.F.E. battery of 124 cells. Control is by means of a drum-type tramway controller of standard design modified for single motor operation. The spare contacts on the reversing cylinder of the controller are utilised to effect the changeover in the head and tail lighting, in accordance with the position of the reversing handle, and consequently, the direction of travel of the locomotive. The battery is charged from a rectifier substation adjacent to the running shed, and a boost is given to the battery during the midday dinner interval.

The remaining electrical equipment follows the usual lines, and includes two circuit-breakers, a meter of the Sangamo type, a charge and discharge ammeter, a voltmeter, and the necessary lighting switches. Accelerating and braking resistances are of the latest edgewise-wound strip construction and are specially designed for the arduous duties associated with industrial haulage. Rheostatic braking is provided and there are hand brakes on all wheels. The locomotive can haul some 75 tons on the level.

Although it is not permissible to mention the nature of the duties regularly performed by this locomotive, it may be said that the absence of fumes, grit, or sparks makes it ideal for the work to be done.

PENNSYLVANIA ELECTRIC FIGURES.—According to a paper read recently in America, the Pennsylvania Railroad has in traffic about 900,000 h.p. of electric locomotives capable of delivering peaks aggregating more than 1,000,000 h.p. at the wheel rims. These locomotives consume approximately 1,000 million kWh of energy a year, supplied from 364,000 kVA of single-phase 25-cycle generators over 1,100 miles of 132 kV transmission lines.

BLUE ELECTRIC TRAINS ON THE NORTH-EAST COAST.—As an experiment the L.N.E.R. is using a new colour scheme to some of its red and cream Tyneside electric coaches when they are in need of overhaul and repainting. The cream colour above the waist of these vehicles has been retained, but below, separated from the cream by a black line, a shade of blue similar to that used on L.N.E.R. streamline locomotives has been introduced. The numbers are painted black, and the company's totem is displayed centrally in the blue panel, in black letters on a cream background.

SWEDISH ELECTRIFICATION.—In addition to a section of the northern main line from Bastuträsk to Jörn, the Swedish State Railways are also electrifying the Ånge Sundsvall (59 miles), Gävle-Ockelbo (24 miles), and Eslöv-Hälsingborg (31 miles) sections. The two last-named are the first sections of private railways recently taken over by the State to be electrified. Conversion of the 58-mile Gävle-Falun line of the Gävle-Dala Railway has been sanctioned, and it is hoped to complete the work in 1943.

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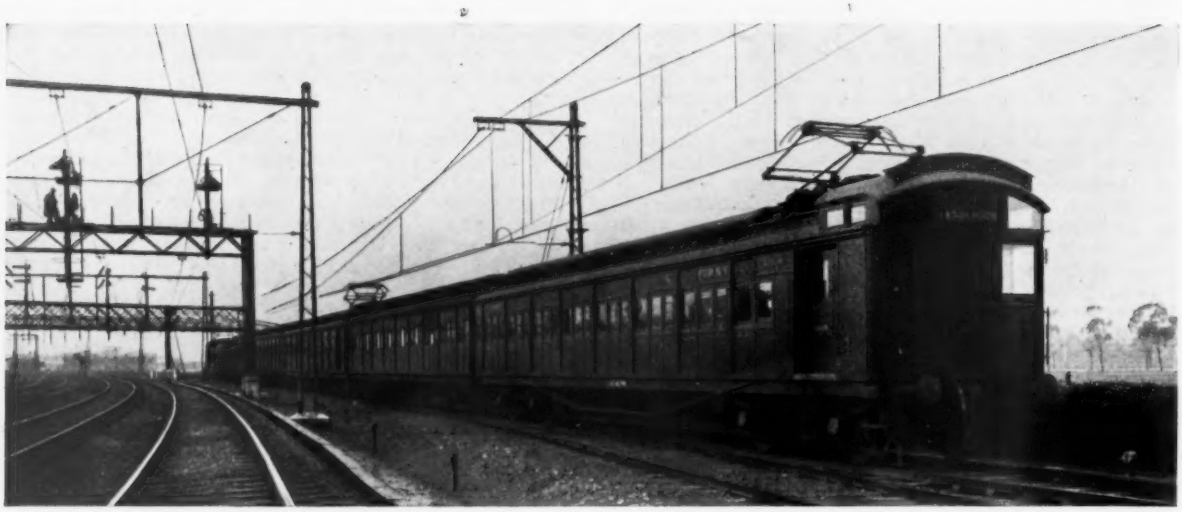
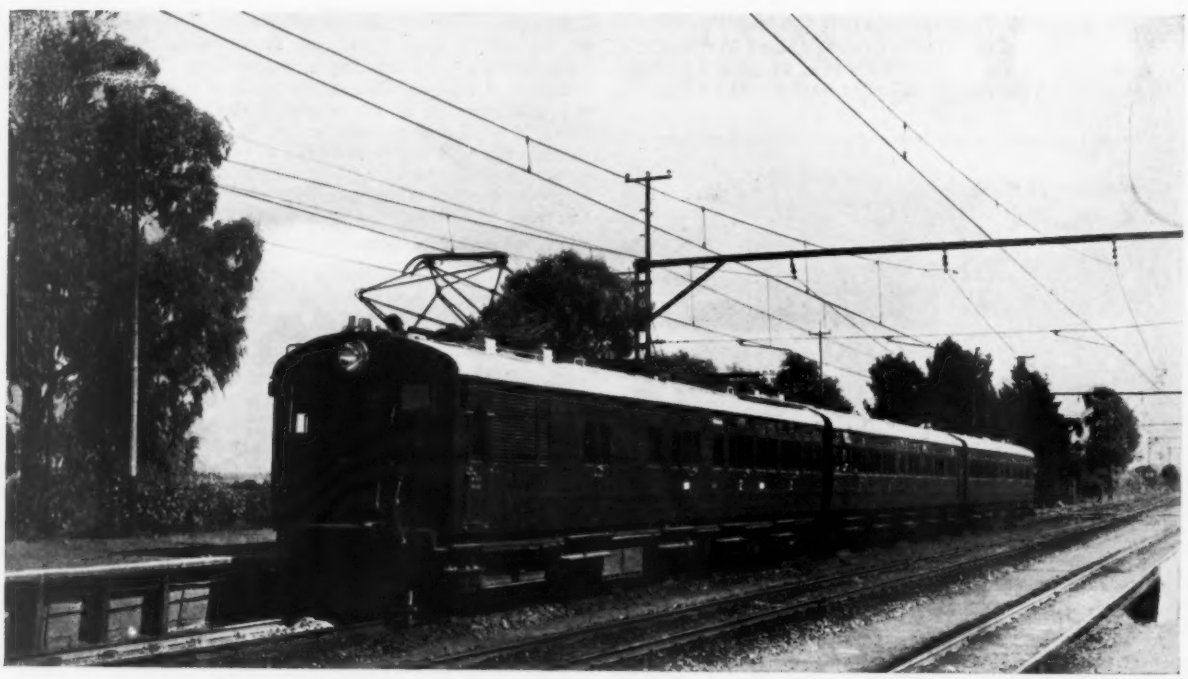
Multiple-Unit Trains in the Dominions



Photo] *A six-coach multiple-unit electric train of the Victorian Government Railways* [J. R. Hind

Of the Melbourne suburban system 172 route miles are electrically worked on the 1,500-volt, d.c. system, with overhead conductors. The electrification was begun in 1919. This particular view was taken some years ago, and shows, on the left, workmen replacing the old standard somersault semaphore signals with colour-light automatic signals

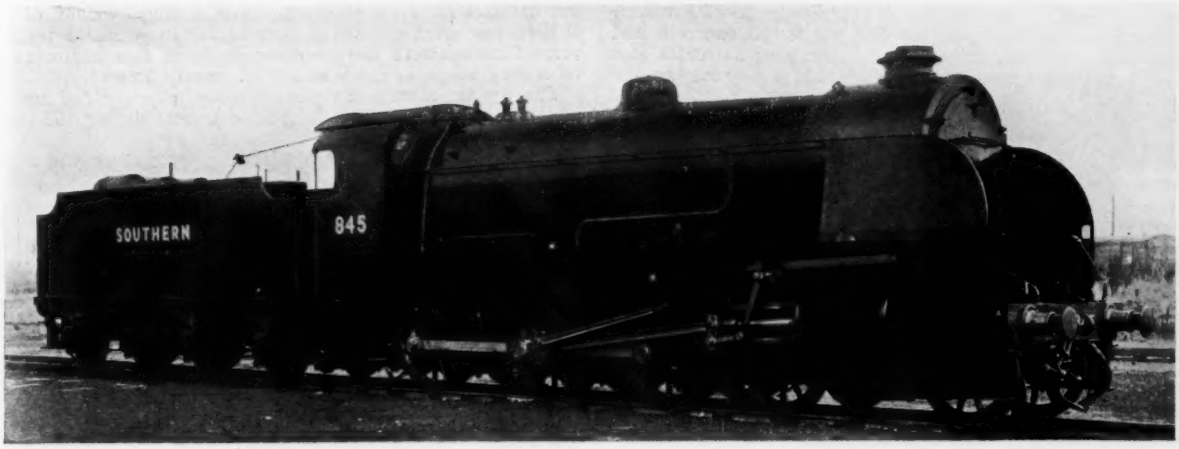


Photo] *Three-coach multiple-unit electric train at Wattles, near Germiston, South African Railways* [J. F. Marr

The Germiston-Wattles line was the first Reef section to be electrified on the South African standard 3,000-volt d.c. system, with overhead conductors, and the first electric trains in the Transvaal ran in July, 1937. The suburban lines round Cape Town, amounting to 45 route miles, are electrified on the 1,500-volt d.c. system, with overhead conductors

NEW SOUTHERN RAILWAY STANDARD LETTERING

To retain some of the well-known Southern green on engines now painted wartime black, a new style of lettering and numerals, shaded in green, shot with Southern sunshine yellow, has been adopted



Class "S 15" 4-6-0 mixed traffic locomotive, S.R., No. 845, painted black with the new standard lettering and numerals

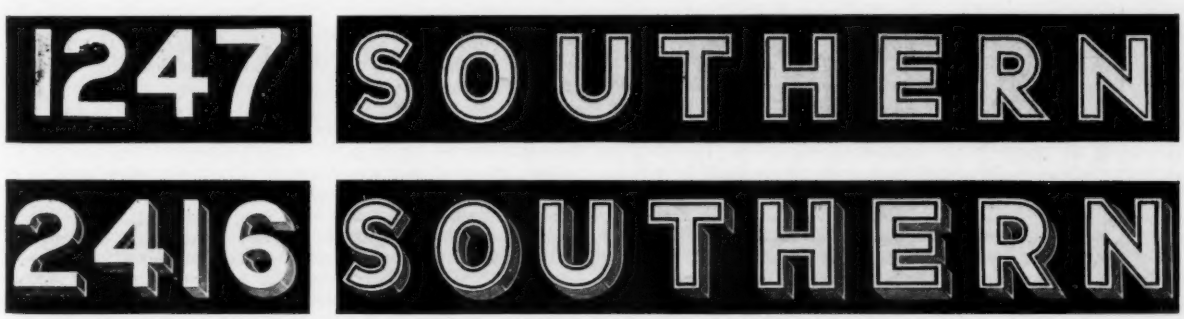
WHEN it became necessary recently for the Southern Railway to abandon its well-known green livery for all but 150 of its 1,800 steam locomotives, and paint the remainder black, the question of retaining something of the green so long associated with the company arose. Hitherto the word "Southern" and the engine number have appeared in standard unshaded gold lettering and black-shaded numerals on the locomotives, whether green or black. Now a new style has been evolved which retains on the black engines some of the bright green in the form of shading, with dashes of "Southern sunshine," which makes the yellow (old gold) lettering stand out and offsets the lack of lustre of the gold leaf. The same style of shaded lettering is also to be adopted for the green engines, but the gold leaf will be retained, instead of the more economical yellow of the lettering on the black engines. From our illustration it will be seen that the new style of lettering is bold and striking, lending a much-needed relief to what would otherwise be a sombre background.

Arising from the increasing labour scarcity and the rising cost of paint, the Southern Railway has also decided to extend the use of transfers in replacement of hand-painted lettering for all phases of railway work, including, in addition to locomotives, carriages and other rolling stock, road vehicles, hand trolleys, station direction and other signs.

A new standard alphabet and numerals have been approved, and details are now being worked out on the principle of the new locomotive lettering. A very considerable saving will be effected through this scheme, as well as an improvement in ready legibility and the appearance of the company's equipment generally.

The whole scheme has been worked out by close co-operation between the Chief Mechanical Engineer, Stores Superintendent, and the Public Relations and Advertising Officer to the General Manager.

Cab and tender of Class "N" 2-6-0 locomotive No. 1859 in the new style



The new numerals and lettering (below) contrasted with the old (above)

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CONCRETE SLEEPERS ON THE G.W.R.

Some notes on experience during the past 25 years, with special reference to modern practice

SOME experimental work was carried out by the Great Western Railway with the use of concrete sleepers in 1917-18, when small quantities of various types and sizes were made at the company's concrete works at Taunton, but it soon became apparent that reinforced concrete had little chance of competing with timber sleepers under fast main-line traffic, failures occurring almost as soon as the sleepers were put into service.

In light branch lines the position was different. Of 36 concrete sleepers, 8 ft. long × 8 in. wide × 6 in. deep, laid in the Barnstaple branch, six lasted two years, another six lasted seven years, twelve gave nine years' life, and twelve more were not removed until they had been in the track fourteen years. At this time the maximum speed on the branch was 30 m.p.h. and the average number of trains 14 a day.

Further tests with sleepers of similar and other designs, including circular pot sleepers connected at intervals by tie bars, were made in the goods loop line at Taunton, where the rails were f.b., speed was restricted to 10 m.p.h., and 40 trains a day passed. Although many of the sleepers showed cracks after varying periods, the trials were not considered altogether unsatisfactory. The matter was not pursued further at that time as the position in regard to the supply of recovered wooden sleepers suitable for siding purposes had not reached the position which prevails today.

Soon after the outbreak of the present war, however, it was realised that the question of an alternative for timber sleepers would need early consideration, and the results of the previous trials were reviewed in conjunction with such information as was available from other sources. As a result, it was decided to confine further attention to the design of concrete sleepers of the pot type rather than the full-length transverse pattern, the principal consideration being the excessive weight of transverse sleepers for handling compared with timber, and the necessity for economy in the use of steel for reinforcement. The average weight of a chaired creosoted wooden sleeper is 237 lb. whilst a transverse ferro-concrete sleeper complete with two chairs and bolts may weigh as much as 550 lb. (nearly 5 cwt.).

The design of the pot sleeper eventually decided upon and manufactured in considerable numbers during the last

G.W.R. reinforced concrete pot sleepers

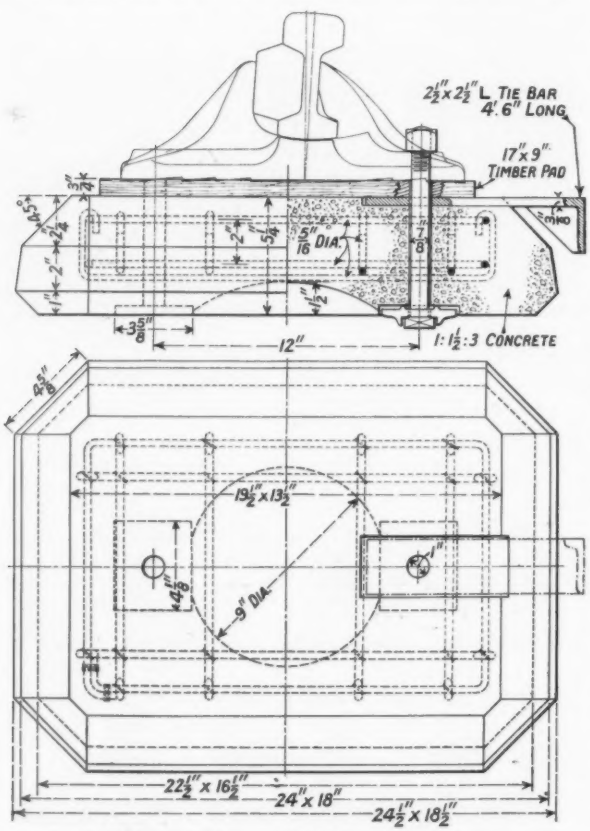
18 months is shown on the drawing. It weighs 246 lb. when chaired, and contains only $5\frac{3}{4}$ lb. of reinforcement in the form of $\frac{5}{16}$ in. dia. steel bars. The rail chairs are secured by two $\frac{7}{8}$ in. dia. chairbolts with standard ribbed washers on the underside. An elm bearing pad $\frac{3}{4}$ in. thick is used between the chair and concrete. Tie bars 4 ft. 6 in. long for connecting together pairs of pots are made from $2\frac{1}{2}$ in. × $\frac{3}{8}$ in. steel angle, and are secured by the inside chairbolts as shown on the drawing.

For goods loops and heavily worked sidings these tie bars are fixed between alternate pairs of pots, but in other instances, especially in the vicinity of buffer stops, the spacing is increased so that four angle ties are used per 45-ft. length of track. In all cases timber sleepers are laid on both sides of the rail joints.

The pots are cast in the inverted position in concrete moulds lipped with steel plate; the base mould is of wood. The aggregate consists of granite chippings, and with rapid hardening cement is used as a 1 : $1\frac{1}{2}$: 3 mix consolidated by mechanical vibrators. The normal period allowed for maturing is four weeks, but this is almost invariably exceeded due to the fact that the pots are not brought into use until some time after despatch from stock. The scale on which manufacture is carried out can be gauged by the fact that the present output of these articles is at the rate of 150,000 pots per annum.

Experience has shown that where concrete pot sleepers are used on newly tipped formation it is desirable to allow as much time as possible for consolidation, otherwise special attention to packing may be found necessary in order to obtain a satisfactory top on the road. Apart from this, the maintenance of track laid on pot sleepers has not so far called for any abnormal attention during the somewhat limited period it has been in use.

Pot sleepers similar to those described, but without reinforcement, have been made for test purposes in very lightly worked situations, but insufficient time has elapsed to enable any information to be recorded as to their behaviour. Plain concrete blocks were used to some extent during the last war, and in suitable localities appear to have answered the purpose for short term patching purposes.

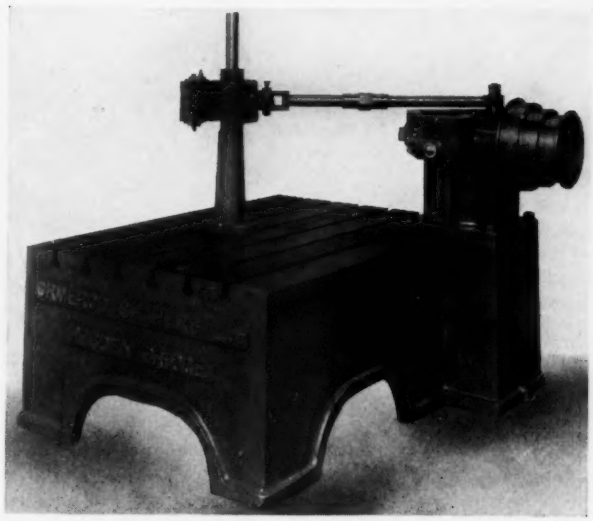


Section and plan of G.W.R concrete sleeper

A NEW RADIAL SHAPING MACHINE

THE machine tool illustrated is a radial shaper designed and manufactured by Ormerod Shapers Limited, of Hebden Bridge, Yorks. It comprises a heavy box base, column and swivelling head, and has been designed for machining internal radii on large work pieces. The method of operation is to secure the work to the box table, on the top of which six tee slots of special depth are provided for the purpose. The swivelling head is then located by a stud on the work piece to be machined, and the length of stroke is adjusted in the tee slot of the driving worm. This worm is of large diameter pitch and meshes with a steel worm driven by a three-speed cone pulley, and overhead countershaft; the worm and worm wheel run in an oil bath. The position of the arc through which the tool travels may be regulated by the right-hand and left-hand adjusting sleeve on the connecting rod. Horizontal and vertical adjustments of the tool are made by hand through a screw fitted with thrust collars.

The illustration shows the machine fitted with a swivelling head, capable of dealing with radii from 7 in. to 8 in.; the tool has a vertical travel of 2 in. and horizontal adjustment of 5 in. Other radii, up to 18 in. diameter, may be accommodated by a series of toolheads, each of which has horizontal and vertical tool adjustment. The machine may also be arranged for single pulley belt drive, or for self-contained motor drive. It requires a floor space of 5 ft. 6 in. by 5 ft. 6 in., and weighs approximately 40 cwt.



Ormerod radial shaper

Railways and the Paper Salvage Campaign

SALVAGE CAMPAIGN
SEE HOW YOUR WASTE PAPER MAKES MUNITIONS
SALVAGE CAMPAIGN
THIS EXHIBIT SHOWS YOU HOW YOUR WASTE PAPER HELPS TO WIN THE WAR. PLEASE PUT YOUR NEWSPAPERS AND CARTONS IN THE NEAREST RECEPTACLE.
SALVAGE CAMPAIGN
THIS IS EVERYBODY'S WAR AND EVERYBODY'S WASTEPAPER IS WANTED TO MAKE THESE WAR ESSENTIALS.

LEND
SALVAGE CAMPAIGN
SEE HOW YOUR WASTE PAPER MAKES MUNITIONS
SALVAGE CAMPAIGN
THIS EXHIBIT SHOWS YOU HOW YOUR WASTE PAPER HELPS TO WIN THE WAR. PLEASE PUT YOUR NEWSPAPERS AND CARTONS IN THE NEAREST RECEPTACLE.

Two views showing the attractive layout of the L.M.S.R. display cabinet for furthering the waste paper salvage campaign

Even in peacetime the salvage of scrap material was no novelty to the British railway companies, and they have had effective organisations at work for many years past. With the advent of war such organisations have been considerably strengthened and developed, and one form of amplification has been the introduction of an intensive campaign of public instruction, and, what is even more important, the provision of adequate facilities for collecting and handling the waste thus secured; special dumps, collection vans, and so forth, have been described in our columns from time to time. Now that the salvage of paper is assuming even greater importance than heretofore, the L.M.S.R. has prepared a display of war essentials made of paper, to inform railway staffs and passengers of the purposes to which their salvaged paper are devoted. This case was first exhibited at Huddersfield station booking hall, where thousands of persons examined the display organised by the local L.M.S.R. staff. The cabinet can be packed easily for transit, and is thus readily available for use at any point on the L.M.S.R. system where it may be usefully employed in connection with the local salvage drives which are achieving so marked a measure of success.

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Railways and the War—91

Right: Sir Alan Anderson handing cheques for the proceeds of the fund raised by the railway mobile picture gallery to representatives of the Forces

(*See page* 484 *of our issue last week*)

Left: A 16*-in. gun was recently moved from Watertown Arsenal, Massachusetts, to Fort Church, Rhode Island U.S.A. It was* 68*-ft. long, and the combined weight of the gun and the specially constructed* 24*-wheel wagon was over* 200 *tons*

Various uses for the "third class only" sign which denotes trains on which first class fares have been abolished since October 6. These pictures, taken on the Southern Railway, show the sign on platform fingerboards, train departure indicators, and on the platform barrier board

RAILWAY NEWS SECTION

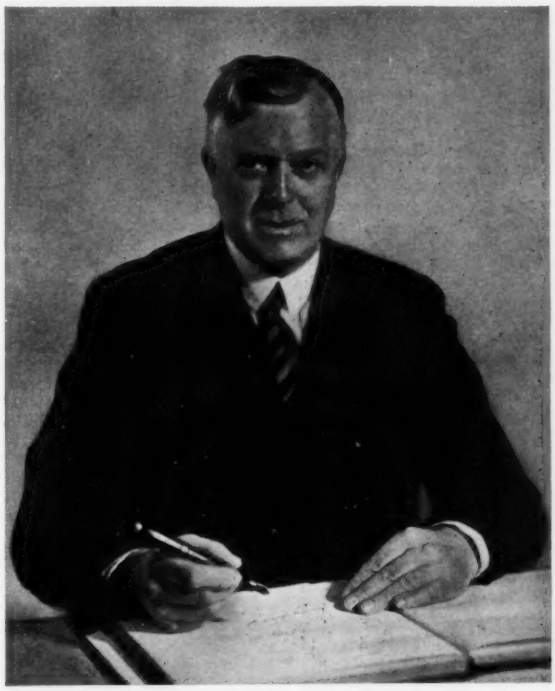
PERSONAL

The late Mr. Frank Pick

We regret to record the death, on November 7, of Mr. Frank Pick, Vice-Chairman from 1933 to 1940 of the London Passenger Transport Board. Mr. Pick, who would have been 63 years of age on November 23, died suddenly at his home in north-west London. For the past two years his health has not been entirely satisfactory, but he has nevertheless undertaken various Government commissions since his retirement from London Transport.

Mr. Frank Pick was born at Spalding, in Lincolnshire, on November 23, 1878, and was educated at St. Peter's School, York. Subsequently he was articled with Mr. George Crombie, Solicitor, York. In 1902 he qualified as a solicitor with second-class honours, and in 1903 became LL.B. (London University) with first-class honours. In 1902 he entered the service of the North Eastern Railway Company under Sir George Gibb, the then General Manager, and worked successively in the statistics office, district superintendents' offices at Sunderland and Newcastle-on-Tyne, the rates office, and, finally, the general manager's office. In 1906, he came to London with Sir George Gibb, on the latter taking over the management of the Metropollitan District and the London Electric Railways, and, upon Sir George Gibb's retirement in 1907, Mr. Pick was transferred to the staff of Mr. A. H. Stanley, now Lord Ashfield. Mr. Pick became Traffic Development Officer in 1909, and Commercial Manager in 1912. In these capacities he was engaged upon the building up of the system of bus routes and also the advertising department. In 1917 he was appointed by Lord Ashfield, then President of the Board of Trade, to take charge of the Household Fuel & Lighting Branch of the Coal Mines Department, under the late Sir Guy Calthrop, and was responsible for the preparation and administration of the orders governing the retail distribution of coal and its rationing for domestic use until 1919. In 1914 he visited Paris and Berlin; and in 1919 he went to New York, Cleveland, Detroit, and other American cities to study traffic problems. In 1921 he was appointed joint Assistant Managing Director of the companies comprised in the Underground group, and in 1924 he assumed full administrative control under Lord Ashfield. His appointment as Managing Director dated from March, 1928. In the same year he was appointed a Member of the Royal Commission to consider the general powers and duties of police in England and Wales in the investigation of crimes and offences. Shortly after the establishment of the London Passenger Transport Board, under Act of April 13, 1933, Mr. Pick was appointed by the Appointing Trustees as a full-time Member of the board for a term of seven years from May 18, 1933.

On July 1, 1933, the day the London Passenger Transport Board began its operating life, Mr. Pick was appointed Vice-Chairman. When the Government scheme for the evacuation of children and other priority classes from the London area was decided upon, Mr. Pick was asked to assume responsibility for organising the whole of the traffic movements, and it is common knowledge that, upon this scheme being put into effect with the worsening of the international situation towards the end of August, 1939, the transport arrangements that had been evolved under Mr. Pick's supervision functioned with expedition and efficiency, and entirely without casualties. Mr. Pick was appointed a member of the Railway Executive Committee established by Order of the Minister of Transport under the Defence Regulations on September 1, 1939. His seven-year term of office as a full-time Member of the London Passenger Transport Board expired on May 18, 1940, and in the middle of April of that year he made it known that he was not submitting his name to the Appointing Trustees for reappointment, but intended to retire. Accordingly he left the London Passenger Transport Board, and also the Railway Executive Committee in May of last year. In June, 1940, however, the Minister of Transport arranged for Mr. Pick to visit certain ports in the United Kingdom and to report on the organisation that had been set up to secure the speedy discharge and clearance of goods; he began his series of visits on June 17. When this task was completed, the Minister of Information appointed Mr. Pick to be Director-General of the Ministry of Information as from August 12, 1940. He resigned four months later, and in February, 1941, accepted the invitation of the Minister of Transport to investigate and report upon the carriage of traffic on canals and inland waterways. He duly reported, and at the time of his death was associated with the Ministry of War Transport in connection with canal traffic. Mr. Pick was a Foundation Member of the Institute of Transport and was elected President for the year 1932; a Member of the London & Home Counties Traffic Advisory Committee; an Honorary Member of the R.I.B.A.; a Member of the Royal Commission on Police Powers & Procedure; and Chairman of the Council for Art & Industry of the Board of Trade. Mr. Pick was a Member of the Reform Club and he described his recreations as "the study of the wider aspects of transport and seeing the world."



The late Mr. Frank Pick

Vice-Chairman, London Passenger Transport Board, 1933–40

The cremation took place privately at Golders Green on Tuesday at 10.30 a.m. A memorial service was to be held at St. Peter's Church, Eaton Square, yesterday (Thursday) at 12.30.

An Appreciation from Lord Ashfield

The sudden death of Frank Pick came as a shock to me and to my colleagues on the London Passenger Transport Board and to the officers and staff of the board. To me it represents the loss of a valued friend and a loyal business colleague. Frank Pick came to London with Sir George Gibb in 1906, and I first met him when I came over from the United States in 1907. During the thirty-three years that followed we were continuously engaged in a common task and worked together in happy association and in complete harmony one with another. I look back on this long association with considerable pride and gratitude, for it is the privilege of few men to have had so gifted and so loyal a collaborator.

Pick possessed outstanding qualities. He had an alert and vigorous mind, an intellect of the highest order, and an immense capacity for work. Beneath a somewhat austere exterior there was a warm and generous nature. Completely without thought of self, his whole life was dedicated to furthering the interests of those whom he served. As an administrator Pick was pre-eminent. During the years that he and I worked together great changes took place in the operation and organisation of London's passenger transport services. The electric railways were developed and vastly improved, the horse-drawn bus was supplanted by the motorbus, and the tram began to give way to the trolleybus. With the growth of the Metropolis the local passenger transport systems were continuously extended. And throughout the period the different systems were

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gradually consolidated—a process which reached its culmination, after years of labour, in the formation of the London Passenger Transport Board in 1933. In these tasks Pick played an increasingly important part as the years passed, and it was largely due to his ability and skill in the administration of the undertakings with which he was connected that in the end our work was brought to fruition.

The establishment of the board was, however, but the prelude to a period of yet greater activity. He was appointed Vice-Chairman and Chief Executive Officer of the board at the outset. The responsibilities he then assumed were enormous and he discharged them brilliantly. The many constituent undertakings merged in the board were fashioned into a single co-ordinated system. The organisation was perfected and became a vital creation of great efficiency. The £40 millions programme of extensions and improvements was planned and put in hand in 1935; but for the war this programme would by now have been completed. Many other striking improvements were effected. Then came the darkening shadows of war and the undertaking had to be placed on a war footing, and with it the transport arrangements for the evacuation of the women and children of London, for which Pick became responsible. It was during the period he held the office of Vice-Chairman of the board that his great qualities of mind and character and his ability were manifest perhaps more than at any other time. His wide experience and intimate knowledge of transport and large-scale organisation, and the fruits of his years of study of social conditions were placed at our disposal without reserve. He never spared himself, and the board—and London too—are very greatly in his debt. He was a great Londoner and a great servant of Londoners.

One of the secrets of his success was the close personal attention and care he always gave to every aspect of his work. He was at all times the master of his subject. Whether the matter at hand was just the design of a poster or the direction of some departmental activity, or whether it was the evolution of a new type of vehicle, the building of a new station, the layout of a works, the construction of a new railway extension, or the piloting of intricate legislation through Parliament, Pick never failed. His keen and analytical brain would grasp the essentials of every problem and cut away those unessentials which so often obscure the vision of lesser men. But never did he lose his sense of proportion; he saw each and every problem in its proper perspective and in due relationship to the task as a whole.

Pick was a man of wide interests and culture. His love of art and literature informed much of his work as a transport administrator. He made a close study of architecture and his knowledge and thought in this direction find permanent expression in many London Transport stations, bus garages, and other buildings constructed in recent years.

In his contacts with his fellows he was very happy. He was considerate and fair in all his dealings. He could transmit his zeal and enthusiasm to others and call forth all that was best in them. No one who came in touch with him could fail to be stimulated by the width and sincerity of his views and by his devotion to his ideals, or to be inspired by the high example which he set. He could not tolerate the second best even in the small things and he taught us the lesson that only the best will do.

Now he has gone from us. We who mourn him recognise that by his passing the world becomes a poorer place. There are all too few of his stature.

Mr. George Toner, who, as recorded in our October 24 issue, has been appointed District Superintendent, Great Southern Railways, at Galway, is the son of the late Mr. William Toner, who was for many years Stationmaster at Broadstone. Mr. George Toner joined the service of the former Midland Great Western Railway in 1904 as a junior clerk in Dublin and later acted as personal clerk to the Superintendent of the Line. Later he acquired general experience working in the claims and other sections of the Traffic Manager's office, and was subsequently promoted to the General Manager's office. In 1919, Mr. Toner was appointed to take charge of the goods rolling stock distribution and later was placed in charge of the Operating Section of the Traffic Manager's office of the amalgamated railways at North Wall. In 1938 he was appointed Livestock Superintendent, the position he now relinquishes to take up his new appointment.

Mr. P. J. Lyne, who, as recorded in our October 24 issue, has been appointed District Superintendent for the Dublin & South Eastern Area of the Great Southern Railways, with headquarters at Westland Row, Dublin, joined the clerical staff of the Great Southern & Western Railway in 1911 and served in various country stations until 1914 when he joined the British Army, in which he rose to the rank of Captain in the Royal Munster Fusiliers, and was awarded the Military Cross and mentioned in dispatches. In 1919 he returned to headquarters in Kingsbridge where he remained until 1934 when he was sent to New York to represent the Great Southern Railways in the Associated British & Irish Railways office. On his return in 1939 Mr. Lyne was stationed temporarily in Cork and acted as assistant to the District Superintendent of the Cork District.

Sir John Ernest Jackson, C.I.E., whose death we recorded in our October 31 issue, was born in 1876 and educated at Marlborough College. He qualified as a chartered accountant and went to India in 1900 as Assistant Auditor, East Indian Railway. In 1907 he became Chief Auditor of the Calcutta Port Trust, and four years later was made Chief Auditor of the Bombay, Baroda & Central India Railway. He acted as Agent to the railway for two periods, was confirmed in the position in 1925, and held it until 1932. During his 21 years of service with the B.B. & C.I.R. Sir Ernest had experience of the difficulties resulting from the last war in the matter of equipment. He was concerned also with the provision of suburban electrification and the construction of the new long-distance terminus. Sir Ernest was created a C.I.E. in 1918 and was knighted in 1924. He was President of the Indian Railway Conference Association for 1927–28.

Mr. George Toner

Appointed District Superintendent, Galway, Great Southern Railways

Mr. P. J. Lyne

Appointed District Superintendent, Dublin & South Eastern Area, Great Southern Railways

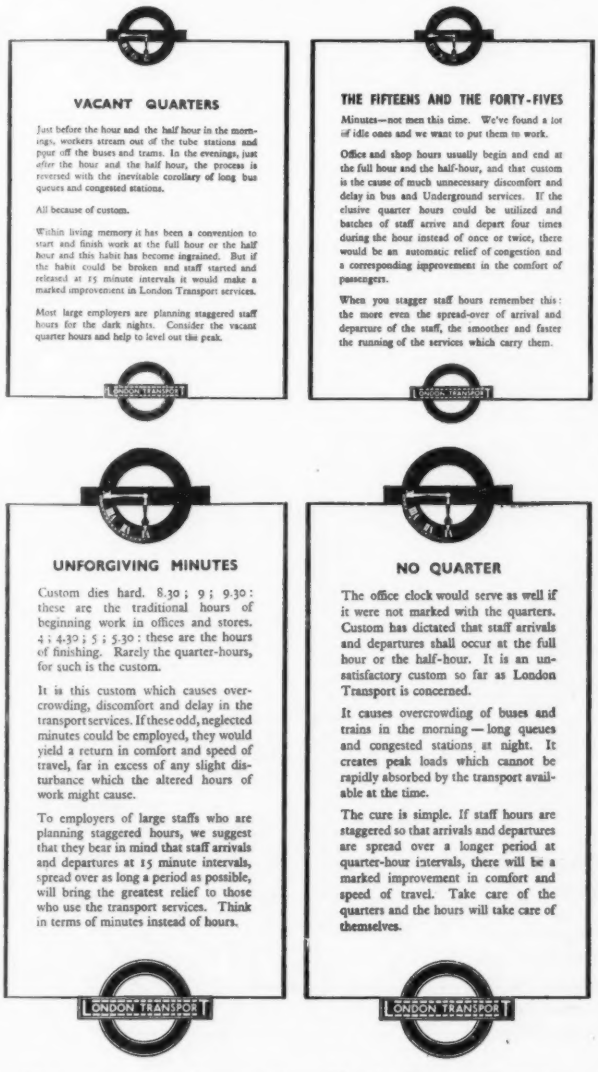
The late Sir Ernest Jackson C.I.E.

Agent, Bombay, Baroda & Central India Railway, 1924-1932

TRANSPORT SERVICES AND THE WAR—115

Easing war workers travel—Improved livestock conveyance—German transport position—Train service curtailments in Sweden—Transport of aid to Russia

The Ministry of War Transport and the Ministry of Labour & National Service are initiating a campaign with the object of inducing passengers who can choose their time of travel to make their journeys between 10 a.m. and 4 p.m. This campaign is to be supported by posters, press advertisements, and a film introducing Elsie and Doris Waters, and is one of the many ways in which the Government is endeavouring to ease travelling difficulties of war workers this winter. Other measures include development in the policy of staggering working hours, the transfer of buses from non-essential to essential work, and the production of standard-type buses. In the London area schemes of staggering of work hours now in operation affect over 500 undertakings and 250,000 workers; other schemes now to be worked out are expected to bring the total up to half a million. The supply of new vehicles is strictly limited, and to save time, labour, and materials a standard type of double-deck bus to seat 56 passengers has been designed, and it is hoped that next year several hundreds of these will be produced. In the London area a campaign was launched last year, but the public response did not meet the hopes of the Government; then the Government asked casual travellers to finish with transport by 4 p.m. In fact it has been noticed that many persons have now gone to the opposite extreme, and that housewives are tending increasingly to do their shopping first thing in the morning, as a result there is a danger that the early morning peak may become as serious as the evening peak.


VACANT QUARTERS
Just before the hour and the half hour in the mornings, workers stream out of the tube stations and pour off the buses and trams. In the evenings, just after the hour and the half hour, the process is reversed with the inevitable corollary of long bus queues and congested stations.
All because of custom.
Within living memory it has been a convention to start and finish work at the full hour or the half hour and this habit has become ingrained. But if the habit could be broken and staff started and released at 15 minute intervals it would make a marked improvement in London Transport services.
Most large employers are planning staggered staff hours for the dark nights. Consider the vacant quarter hours and help to level out the peak.
LONDON TRANSPORT
THE FIFTEENS AND THE FORTY-FIVES
Minutes—not men this time. We've found a lot of idle ones and we want to put them to work.
Office and shop hours usually begin and end at the full hour and the half-hour, and that custom is the cause of much unnecessary discomfort and delay in bus and Underground services. If the elusive quarter hours could be utilized and batches of staff arrive and depart four times during the hour instead of once or twice, there would be an automatic relief of congestion and a corresponding improvement in the comfort of passengers.
When you stagger staff hours remember this: the more even the spread-over of arrival and departure of the staff, the smoother and faster the running of the services which carry them.
LONDON TRANSPORT
UNFORGIVING MINUTES
Custom dies hard. 8.30; 9; 9.30: these are the traditional hours of beginning work in offices and stores. 4; 4.30; 5; 5.30: these are the hours of finishing. Rarely the quarter-hours, for such is the custom.
It is this custom which causes overcrowding, discomfort and delay in the transport services. If these odd, neglected minutes could be employed, they would yield a return in comfort and speed of travel, far in excess of any slight disturbance which the altered hours of work might cause.
To employers of large staffs who are planning staggered hours, we suggest that they bear in mind that staff arrivals and departures at 15 minute intervals, spread over as long a period as possible, will bring the greatest relief to those who use the transport services. Think in terms of minutes instead of hours.
LONDON TRANSPORT
NO QUARTER
The office clock would serve as well if it were not marked with the quarters. Custom has dictated that staff arrivals and departures shall occur at the full hour or the half-hour. It is an unsatisfactory custom so far as London Transport is concerned.
It causes overcrowding of buses and trains in the morning—long queues and congested stations at night. It creates peak loads which cannot be rapidly absorbed by the transport available at the time.
The cure is simple. If staff hours are staggered so that arrivals and departures are spread over a longer period at quarter-hour intervals, there will be a marked improvement in comfort and speed of travel. Take care of the quarters and the hours will take care of themselves.
LONDON TRANSPORT

Newspaper advertisements issued by the London Passenger Transport Board in connection with its campaign for staggering the hours of travel by workers

Priority Transport for Workers

In the provinces, on the other hand, considerable success has been achieved by systems of registration for bus travel, as already noted from time to time in these columns. Such registration, by employers of labour, enables the transport operator to provide facilities for essential workers and to identify those workers by means of badges, permits, special return tickets, and so forth. At page 421 of our October 24 issue, we recorded the intention of the Western National Omnibus Co. Ltd. to introduce experimentally on three routes in the neighbourhood of Plymouth a scheme for the issue of special permits to workers and business persons; this scheme has now been brought into effect. Initial registration was completed on October 15, and the arrangements came into force on October 20, on the three routes in question. Preference is given to permit holders if accommodation is limited at rush hours, generally from 6 a.m. to 9 a.m. and from 5 p.m. to 7.30 p.m. At the main stopping places intending travellers are formed into two queues, one for permit holders and one for others. No passengers are refused, provided accommodation is available, but the permit holders are given first consideration. The issue of permits is made solely to indicate that the holder is engaged on essential work. Should the scheme prove successful, consideration will be given to extending it to other routes.

Immobilisation of London Trams and Buses

In view of the risk that damaged trams, trolleybuses, and buses may be set in motion inadvertently during rescue and first aid operations after air raids, instructions have been given to all air raid wardens in the London area concerning the immediate action which can be taken in the event of both driver and conductor of the vehicle becoming casualties, or otherwise being compelled to abandon charge of the vehicle. These instructions take the form of practical and simple information about the application of handbrakes, the method of removing trolley arms from overhead wires, cutting off power by means of circuit breakers, and so forth.

Transport of Stock from Farms to Collecting Centres

The Ministry of Food, in co-operation with the Ministry of War Transport, has prepared a scheme to assist farmers who experience difficulty in arranging transport to take fatstock from their farms to collecting centres and also to facilitate the better organisation of such transport and thus secure important economies in the national effort. The new scheme will operate for stock entered for presentation on and after November 17. Farmers will still be at liberty to make their own arrangements but many may wish to use the new facilities. Producers who wish transport arranged for them should, when entering stock, clearly mark on form M.A.T. the words "Transport required." The District Chairman of Auctioneers will send the requests from all producers requiring transport to his centre to the representative of the local livestock hauliers attached to the centre. The latter will give the necessary instructions to the individual hauliers who will inform the producers of the time at which they propose to collect the livestock and of the charge for collection. In order to avoid the risk of delay in the collection of stock from other producers, farmers are urged to have their animals ready for collection at the pre-arranged time. Beyond undertaking to pass on the request for transport to the hauliers, the Government and the representatives of the local livestock hauliers accept no responsibility in the matter. Transport charges, responsibility for damage to animals in transit, etc., will continue to be matters for settlement between the farmer and the haulier. In the interests of economy in road transport and to ensure that vehicles are fully loaded, producers who have breeding or store stock for transport to a centre at the same time as fatstock, may notify District Chairmen of Auctioneers that they will also have other stock for transport to the Collecting Centre. Pro-

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viding that the request for transport for other stock is made by producers at the same time as they enter the fatstock, the transport for all stock will be arranged under the scheme.

Special Trains for the Forces

During the first two years of the war, 77,000 special trains for troops and their equipment have been run by the British railways to meet the requirements of the fighting Forces.

American Aid for British Railways

Quantities of steel rails and a number of mobile cranes for use at ports and in goods depots have reached this country from the United States to help speed up the movement of war freights on the British railways.

A.R.P. and Evacuation in India

The question of evacuating certain classes of persons from Calcutta in the event of the imminent risk of air raiding was discussed recently by Government officials, representatives of the railways, and the Calcutta Corporation.

Film Made by Non-British Argentine Railway Staffs

At the conclusion of the ordinary general meeting of the Buenos Ayres Western Railway Limited, held in London on November 5, Mr. J. M. Eddy, the Chairman, invited stockholders to view the showing of a film which has been made by the non-British staffs of the company, and of the Buenos Ayres Great Southern and Midland Railways. Mr. Eddy said that the non-British staffs of these companies had remitted no less than £15,000 to this country as a token of their practical sympathy with the British people in their struggle against Nazi aggression, and that the funds so received had been devoted to the purchase of mobile canteens and so forth.

The film depicts a number of scenes showing the operation of the Argentine railway systems, and in particular gives visual demonstration of the organisation set up by the non-British staffs to collect funds for remittance to this country to aid the war effort. Various leading Argentine railway personalities were shown on the screen, including Dr. G. E. Leguizamon, K.B.E., Chairman of the Local Committee, and Major O. Loewenthal, General Manager, of the Buenos Ayres Western Railway.

Freight Traffic in Germany

We reproduce this week the third of the series of German State Railway advertisements, which carries the following text :—

EVERY LABOUR-SAVING DEVICE IS OF MOMENT

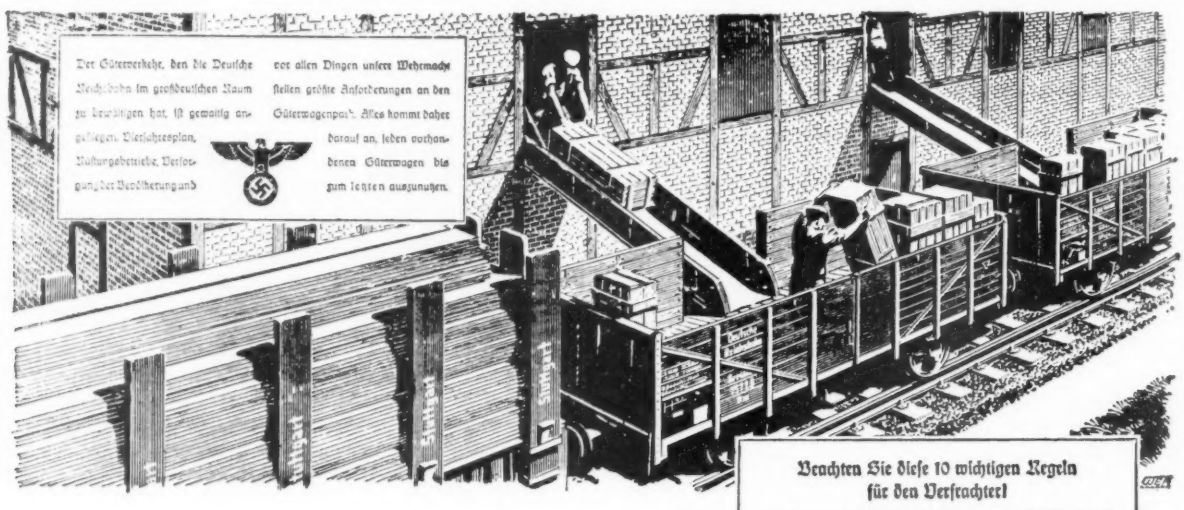
At present we are short of labour. This, however, must not be allowed to cause any delay in loading and unloading goods wagons. Rather we must concentrate on loading and unloading goods wagons even quicker than before, so as to have more wagon space available for satisfying the urgent demand. All labour which can be spared must be saved, mechanical means must be used wherever possible to facilitate the work or to dispense with manual labour. In many cases auxiliary means, such as loading shoots, pulleys, and conveyor bands, considerably facilitate the work.

Set your talent for organisation and the united inventive powers of your concern the task of expediting the circulation of goods wagons as much as possible. Even if the effective movement of wagons be increased by only 10 per cent., it will mean that thousands, nay, tens of thousands, more vehicles will be released for use.

Help the German Reichsbahn and help yourself

New Danish-German Ferry Route

Work was begun on the new ferry route between Denmark and Germany on September 14, simultaneously on the Danish and German sides, at Rødby Havn, on the island of Lolland, and at Femernsund, on Femern, opposite the mainland. At the latter point the channel, which is ½ mile wide, is to be crossed by a causeway with a 600-ft. bridge. The railway on Femern Island will remain a single line, but that on the German mainland may be doubled to Neustadt, whence double track exists to Bad Schwartau on the four-track Lubeck—Kiel main line. It is expected that it will take four years to complete this route, which will consist of a railway and an *Autobahn* running more or less side by side throughout. The causeway and bridges are being designed accordingly. When completed this route will enable Copenhagen to be reached by train from Hamburg in 4½ hr. as against the present 9-hr. journey *via* Rostock and Warnemünde. It will be remembered that—as described on page 663 in our issue of December 27, 1940—the Danish section of the route includes a 23-mile new direct railway to connect Nykøbing and Rødby across the island of Lolland, and a large bridge to connect Nykøbing, which is on Falster, with Lolland. There is an *Autobahn* from the Storstrøm bridge across Falster and


Der Güterverkehr, den die Deutsche Reichsbahn im großdeutschen Raum zu bewältigen hat, ist gewaltig angewachsen. Vierjahresplan, Rüstungsbetriebe, Versorgung, der Verkehr und vor allen Dingen unsere Wehrmacht stellen größte Anforderungen an den Güterwagenpark. Alles kommt daher darauf an, jeden vorhandenen Güterwagen bis zum letzten auszunutzen.

Auf jeden Handgriff kommt es an!

An Arbeitskräften herrscht jetzt bei uns Mangel. Das darf aber nicht zu Stockungen bei der Be- und Entladung von Güterwagen führen. Unser Ziel muß vielmehr sein, Güterwagen jetzt noch schneller als zuvor zu be- und entladen, um auf diese Weise mehr Wagenraum zur Befriedigung des dringenden Bedarfs zur Verfügung zu haben. Jeder entbehrliche Handgriff muß erspart, mechanische Hilfsmittel müssen überall dort eingesetzt werden, wo es möglich ist, dem Menschen die Arbeit zu erleichtern oder ganz abzunehmen. Vielfach bringen behelfsmäßige Mittel, wie Laderutschen, Rollen, laufende Bänder usw. schon wesentliche Erleichterungen.

Setzen Sie Ihrem Organisationstalent und der vereinten Erfindungsgabe Ihres Unternehmens das Ziel, den Güterwagenumlauf so stark als möglich zu beschleunigen. Schon wenn nur eine Beschleunigung des Wagenumlaufs um 10% erreicht wird, stehen tausende, ja zehntausende Wagen zusätzlich zur Verfügung.

Hilf der Deutschen Reichsbahn und Du hilfst Dir selbst!

Beachten Sie diese 10 wichtigen Regeln für den Versender!

1. Güterwagen schnellstens be- und entladen. Rückgabe der Wagen möglichst vor Ablauf der Ladefristen. Überschreitung der Ladefrist hat Ausfall wertvollen Laderaums zur Folge.
2. Wagen rechtzeitig und nur für den wirklichen Bedarf bestellen. Angebotene Ersatzwagen verwenden, selbst wenn kleine Unbequemlichkeiten damit verbunden sind.
3. Pünktliche An- u. Abfuhr der Güter. Mit der Be- und Entladung sogleich nach Wagenbereitstellung beginnen.
4. Für Güterwagen gibt es jetzt keine Sonntagsruhe. Daher Güter, wenn möglich, auch Sonntags verladen. Für eingegangene Güter besteht die Pflicht zur Entladung an Sonntagen.
5. Güterwagen beim Be- und Entladen nicht beschädigen. Lademaße innehalten. Güter ordnungsmäßig und betriebssicher verladen.
6. Durch zweckmäßige Ladegeräte und Hilfsmittel das Be- und Entladen erleichtern.
7. Ausnutzung der Wagen bis zum Ladegewicht und nach Möglichkeit jetzt im innerdeutschen Verkehr bis 1000 kg über die am Wagen angeschriebene Tragfähigkeit. Raumersparnis durch geschickten Stapeln der Güter, ganz besonders durch sachgemäßes und übereinander Verladen sperriger Güter.
8. Nicht mehr Güter zu gleicher Zeit bestellen, als rechtzeitig entladen werden können.
9. Entladung sogleich beim Eingang der Versandanzeige des Absenders oder bei der Vorstellung durch die Güterabfertigung vorbereiten. Fuhrwerke und Ladepersonal schon im voraus für die Zeit der bevorstehenden Entladung bereithalten.
10. Frachtbriefe und sonstige Begleitpapiere sorgfältig ausfüllen zur Vermeidung von Irrläufen.

Dies einschneiden, aufheben und immer wieder lesen!

The third of the German State Railway freight traffic advertisements

XUM

Lolland to Rødby, which, however, misses Nykøbing. The train ferry between Rødby and Puttgarden, on Femern, will take about an hour to cross the 12-mile sound. The peacetime project for this route was dealt with on page 1065 in our issue of June 3, 1938.

Goods Traffic in Vienna

From October 6 the whole of the fast goods traffic has been diverted from the Vienna Sud and Vienna Matzleinsdorf stations to Vienna Ost, with the exception of milk trains, which are continuing to use the Sud station.

Hungarian Transport Levy Increased from 5 to 7½ per cent.

It now appears that the recently-announced increase of 2½ per cent. in Hungarian tariffs is not to benefit the State railways, but to increase the earlier State levy from 5 to 7½ per cent. The date of the increase was July 16.

Danzig and Gdynia

There is a German project for the reconstruction of Danzig and Gdynia as a united port, which would become the most important German outlet on the Baltic, and the central distributing point for north-east Europe. Herr Schmuck, the projector of the scheme, includes in the arrangements the improvement and shortening of the railway approaches to this new seaport from Lithuania and Poland.

The Frontiers of Occupied France

For some weeks it has been reported that modifications were being made to the line of demarcation between occupied and unoccupied France. A copy of *Le Temps* for August 28, which has now reached this country, states that from the end of August the whole of Haute-Savoie has been included in the unoccupied zone of France.

The Frontier of the German Reich

A German Police Decree issued in September gives details of the present administrative frontiers between Greater Germany and other European countries. These frontiers include the Protectorate of Bohemia & Moravia; parts of Poland; the whole of Luxembourg; the Belgian district of Eupen-Malmedy, as well as some of the German-speaking Belgian communities near Bocholz and Montzen; Lower Styria; and Alsace-Lorraine up to the 1914 frontiers.

Railways in Bohemia & Moravia

The Skoda Works have recently built some new producer-gas railcars, driven by gas generated from charcoal, for service on the railways of the Protectorate of Bohemia & Moravia. In announcing this *Der Neue Tag* of Prague, for September 25, stated that the use of this relatively cheap fuel reduced the necessity for the railways to consume costly imported liquid fuel.

Due to wartime needs, and in view of wagon shortage, special instructions have been issued with the object of ensuring rapid loading, despatch, and return of wagons, according to *Lidové Noviny* of September 9.

German Appeal to Belgian Railwaymen

Volk en Staat of August 23 published an appeal to Flemish railwaymen urging them to apply for work on the German State Railway. They were informed that their pay in Belgium was poor and that there was no possibility of any appreciable increase. Moreover the directors of the Belgian National Railways had not yet become imbued with the spirit of National Socialism, but instead were looking forward to a triumphant entry of the Allies into Brussels. Belgian railwaymen were informed that they could earn more by working on the German State Railway and that they would retain all their rights in respect of pensions, sickness benefits, and so forth, as employees of the Belgian National Railways. While in Germany they would replace those German railwaymen who were working in occupied countries.

Drastic Train Service Curtailments in Sweden

Shortage of coal caused drastic curtailments in Swedish train services shown in the summer timetables, as we have previously recorded. Widespread curtailment of coastwise shipping and of road transport services, because of lack of motor fuel, has thrown much additional freight traffic, essential for the needs of the country, on to the railways, and, as freight traffic has to be maintained as far as possible, the most severe reductions in services fall upon passenger traffic. Some of these reductions came into force on May 1 last, but the most serious became effective on June 15. On steam-operated sections wood fuel is now used extensively, and speeds have been reduced.

Except on certain main lines, where one up and one down train is run daily, passenger trains are being run only on three or four days a week. Sleeping and dining cars were withdrawn on June 15, as recorded at page 713 of our June 27 issue. Drastic reductions have also been made in passenger train services on electric lines which depend upon coal for their current supplies. Reductions of fares on all lines, introduced to stimulate traffic, have been withdrawn on both State and private railways.

Doubling Last Section of Simplon in Italy

Plans for doubling the last remaining 15-mile single-track section of the Simplon line, from Gallarate to Arona, are now ready, and the work is to be taken in hand at once. Earlier this year, as reported in these pages, the Arona—Domodossola section was doubled; the 28 miles between Milan and Gallarate was already double track.

Rail Traffic Diverted to Road and Canal in Holland

To relieve railway transport in Holland, roads and inland waterways are to be used increasingly. To overcome the shortage of fuel, all goods transport is effected through central control offices, only essential transport is accepted, and producer gas is supplied as fuel. Some 600 gas-filling stations were in service on October 1, when 8,253 road vehicles had been adapted to run on gas and 3,000 more vehicles were being equipped. Barges are being equipped free of charge. The saving in petrol is stated to amount to 600,000 gal. a month. Gas is produced from wood, peat, coke, and anthracite, supplied in Holland, and from lignite, promised by Germany.

Railway Improvements and New Lines in Jugoslavia

Further progress has been reported on the projected railway improvement and extension works in Croatia, summarised in our issue of September 12 (p. 266). Strengthening of the existing track is now complete between Zagreb and the frontier station Dobova, the Croatian section of the Zagreb—Ljubljana main line; the doubling was planned to be begun in October. Dobova, on the Croatian side of the frontier is being equipped as a common German and Croatian customs station. Plans are ready, and a beginning of construction work has been ordered on the Bihac—Knin and Banja Luka—Pribinic—Usora new sections of the line, and surveys have begun on the Usora—Zenica—Sarajevo new line. Usora and Doboj are close together, and the exact position of the junction is not yet clear.

Transit Traffic in Switzerland

For some time past large quantities of goods destined for Switzerland have accumulated for Portugal awaiting transport, due to the shortage of railway wagons on the Spanish railways. To facilitate this traffic a Swiss motor lorry transport syndicate called Autotransit was formed in Berne on June 6 last, on the basis of a Swiss Federal Decree of February 28, 1941, governing the establishment of such organisations to meet war emergencies. The board of directors of Autotransit consists of 9 members including representatives of the Swiss Federal War Transport Office, the Association of Swiss Motor Carriers in Basle, and the Association of Swiss Motor Lorry Owners in Berne. To begin with 20 motor lorries have been furnished by the Swiss Federal Government as part of an eventual fleet of 100, and the 20 went into service on June 30, when they left Switzerland for Cerbere on the French-Spanish border. The motor lorry service is being maintained between Cerbere and railhead at the Portuguese-Spanish frontier. This arrangement has been made possible by an agreement of April 27 between Spain and Switzerland which expressly permits Switzerland to transport imports and exports through Spanish territory in Swiss motor lorries. At Cerbere the goods are loaded into Swiss rail wagons for transit through unoccupied France. The main Spanish railways are, of course, 5 ft. 6 in. gauge, preventing the through working of Swiss wagons to Portugal, and necessitating the road motor link. Rail transport is used in Portugal.

Railways of European Turkey

The Orient Express route to Istanbul passes from Bulgaria into Greece between Svilengrad and Dikea stations, but within 20 miles crosses into Turkish territory for a distance of 10 miles or less. In this last short section are Adrianople (Edirne) and a large bridge over the Arda river. The next 30 miles are again in Greek territory to just beyond Pithion, where the line crosses the Maritza and enters Turkey. This is the only railway connecting Turkey with the rest of Europe.

When the Germans attacked Greece the Arda and Maritza bridges were destroyed by the Turks, all communication between Turkey and the rest of Europe being thus effectively cut by the latter demolition. In connection with the recent trade agreement between Turkey and Germany by which the Nazis may secure valuable supplies of chrome, a supplementary agreement has been reached between the two countries giving the Turks control over these bridges and arranging jointly for their rebuilding.

As the only safe route for the supply of chrome so urgently needed by Germany is by this rail route, that country has given priority to orders for the materials required for the bridge reconstruction works. Already 15 wagon loads are reported to have been despatched, and the Todt organisation is supervising the work, which is being carried out by German firms.

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The rebuilding of the bridge over the Maritza river on the Turco-Bulgarian frontier is expected to be completed by next February, according to an announcement of the Turkish Minister of Public Works. The reopening of the bridge, which was destroyed when the Germans invaded Greece last spring, will permit of the resumption of through railway traffic with other European countries.

It is stated on good authority that, instead of occupying Grecian Thrace as far west as Dimotika at the invitation of the Germans after they had over-run Greece, the Turkish Government preferred to assume control only of the Uzun Kopru to Adrianople section of the Orient Express trunk line.

The New Finnish-Russian Railway

On the outbreak of hostilities between Finland and Russia, coincident with the German invasion of Soviet territory, construction of the Finnish section of the new railway between Kemijärvi and Kandalaksha had proceeded sufficiently for it to be estimated that the line would be ready for traffic in September. The present situation has, of course, prevented any opening for public traffic, but the announcement indicates that the railway may be regarded as virtually complete from the viewpoint of war transport. The construction of this line was one of the conditions of the Treaty of Moscow of March 12, 1940. The Finnish section, from Kemijärvi up to the new frontier between Finland and Russia in the neighbourhood of Salla is 86·4 km. (54 miles) and the estimated cost recently was 265,000,000 Marks, or more than 3,000,000 Marks a km. The original estimate for the line was only 155,000,000 Marks. It has been found necessary to build for the new line 25 bridges, one of which is 308 metres (337 yards) long.

The Murmansk Railway

As part of the line of communications between Great Britain and Soviet Russia, the railway leading from the neighbourhood of Leningrad to the Arctic Ocean port of Murmansk, is naturally of considerable strategic importance. It runs roughly parallel with the frontier between Finland and Russia, and its southern portion would seem to be in danger as a result of the Finnish advance in the region north of Petrozavodsk, with the apparent object of reaching Saroka. Enemy control of the railway in the neighbourhood of Petrozavodsk would sever the connection of the Murmansk Railway with the main Russian system near Leningrad, but, according to a message from *The Times* correspondent in Stockholm, dated November 5, a new railway link has now been completed between Saroka and Plesetsk, on the main line from Volodga to Archangel. Thus, so long as Saroka remains in Russian hands, the Murmansk region can continue to be connected by railway with the rest of Russia. It has not previously been known in this country that the Saroka-Plesetsk link had been completed —probably even now it is available only for through military traffic, and lacks much equipment—but *The Times* correspondent is scarcely justified in describing this new railway as "hitherto unknown," as its course was indicated on the map published at page 108 of THE RAILWAY GAZETTE for August 1 last.

Aid to Russia through Persia

As soon as it was known that transport of war supplies for Russia could pass through Persia, members of the staffs of the British main-line railways travelled by air to investigate the requirements of the Persian railways to enable greatly increased tonnages to be handled. Their reports were quickly approved and recommendations speedily carried out so that cargoes of necessary equipment, as well as medium and heavy locomotives and various types of rolling stock, were collected and despatched. Some of the locomotives were sent from Great Britain, and doubtless a proportion of the oil-burning locomotives which formed the subject of an illustrated article at pages 469 to 471 of our November 7 issue will be used in Persia. Further railway equipment and materials will be needed from other parts of the world, and railway technical staffs will require to be augmented to deal with the increased traffic to Russia passing *via* Persia.

Last week we referred to the possible sources of standard-gauge locomotives and rolling stock, and to the promises already made by the Commonwealth Government in Australia and by the New South Wales Government to supply their quotas. We pointed out that the Commonwealth Railways system has but a limited supply of standard-gauge locomotives and rolling stock, but nevertheless some of this has already been allocated to Persia, and the Federal Government has decided to curtail the transcontinental railway services in order to release this equipment. The New South Wales Government Railways, with far larger stocks of standard-gauge engines and wagons, is releasing a quantity, and is arranging for the more intensive user of the remaining stock to make the transfer possible without serious transport dislocation of essential war traffics in New South Wales itself. Locomotives are also being shipped from Hong Kong.

Apart from rolling stock shortage, the physical condition of the railways of Persia, mainly by reason of geographical difficulties, is such as to make far from easy the regular and rapid transport of heavy loads. Some idea of the position was given in the article published in our October 3, 1941, issue, and since reprinted in brochure form (price 2s.). The northern terminus of the Trans-Persian Railway, at Bandar Shah, on the Caspian Sea, whence goods might be shipped to Baku, has been left high and dry in recent years by the shrinkage of the waters of the Caspian. A scheme indicated by the map at page 326 of our October 3 issue, is to build a new railway from Chirja to other Caspian Sea ports at Mahmoudabad and Naushah, but the route from Teheran would be circuitous. The southern port of the Trans-Persian Railway—Bandar Shahpur—is but a small jetty built out over a mudflat, in which only two medium-sized steamers can lie simultaneously. The railway can carry all that the port can discharge at present, but only for the first 150 miles. For the next 150 miles the gradients become severe, with a ruling figure of 1 in 67, and tunnels succeed one another at the average rate of one a mile. At Andimeshk, therefore, just north of Dizful, trains have to be divided. An increase in available locomotive power over this section will do much to mitigate present difficulties.

Another available route into Persia from the Persian Gulf is *via* Basra and the Iraqi Railways. These run to Khaniqin, on the Persian border, whence the goods have to be hauled by road for approximately 600 miles to Tabriz. The port of Basra can handle much more material than that of Bandar Shahpur, but the railways cannot transport it. Apart from a shortage of rolling stock and insufficient crossings on the single-track line, there is no railway bridge at Baghdad, and the River Tigris has to be crossed by a rail wagon ferry. At the present time the capacity of these metre-gauge Iraqi Railways is being increased by the provision of more rolling stock, more personnel, and more railway crossings. Much of this rolling stock and equipment is being secured from the metre-gauge railways of India. For bulky goods, river transport on the Tigris is to be used, as was the case in the last war.

A further example of aid to Russia was given on November 10, when Colonel J. J. Llewellin, Parliamentary Secretary to the Ministry of War Transport, sent on its way the thousandth goods wagon built by the Southern Railway Company to carry supplies to Russia. S.R. men and women workers, in co-operation with other railway companies which helped with materials, have completed the work in 10 weeks. The wagons are being sent to the Persian Gulf to reinforce the railway facilities for getting supplies to Russia by that route. Fifty L.M.S.R. and 92 L.N.E.R. 2-8-0 freight locomotives are also being sent.

Passenger Train Reductions in the U.S.A.

In response to a recommendation by the Association of American Railroads that duplicate passenger mileage and unnecessary trains should be discontinued so as to release rolling stock for defence purposes, many of the American railway companies in the Eastern States made substantial reductions in their services when the new timetables came into force on September 28. These apply chiefly to poorly-patronised branch lines and to secondary main-line trains, although some famous trains have also been withdrawn. Among the withdrawals of the Baltimore & Ohio Railroad from September 28 were the Columbian trains. The Central Railroad of Georgia is meeting the situation by eliminating mixed trains on certain branches. On the Central Railroad of New Jersey the Blue Comet trains were discontinued on September 28; this de-luxe all-coach train has worked between New York and Atlantic City since 1929. On the Delaware, Lackawanna & Western Railroad, 22 local passenger trains running west of Dover, New Jersey, have been withdrawn. The Erie Railroad made some changes on September 28, and on October 1 abandoned all passenger service between Rochester and Avon, 19 miles. Previous to September 28 the Pennsylvania Railroad had already made a number of passenger train withdrawals, the first of which was effective on July 7, and it pruned the service again on September 28. The Southern Railway System withdrew a total of 26 trains, both passenger and mixed, early in August.

A plan for a pooled service has been formulated by the Chicago-Florida lines and is to be placed in operation on December 17 for the winter season. The plan involves three routes: one over the Chicago & Eastern Illinois, the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Atlanta, Birmingham & Coast, the Atlantic Coast Line, and the Florida East Coast; another over the Illinois Central, the Central of Georgia, the Atlantic Coast Line, and the Florida East Coast; and the third over the Pennsylvania, the Louisville & Nashville, the Atlantic Coast Line, and the Florida East Coast. It will result in a substantial saving in the total train-mileage during the coming winter season as compared with last winter and will release 43 sleeping, coach, dining, and dormitory cars for other service. The daily departures over these routes are reduced by a recasting of schedules and by the operation of certain trains by each route every third day instead of daily. The scheme also provides for pooling Pullman cars and makes tickets available on any train on any of the three routes. There will be four departures from Chicago each day.

XUM

RAILWAY AND OTHER MEETINGS

Buenos Ayres Western Railway Limited

The ordinary general meeting of the Buenos Ayres Western Railway Limited was held at River Plate House, Finsbury Circus, E.C.2, on November 5. Mr. J. M. Eddy, C.B.E., Chairman of the company, presided.

The Secretary, Mr. N. F. E. Grey, having read the notice convening the meeting and the auditors' report,

The Chairman said that at the last meeting Sir Follett Holt had intimated that he would be relinquishing the Chairmanship and he had subsequently decided to retire from the board. Sir Follett had occupied the Chair for over thirteen years with conspicuous ability and it was with sincere regret that the directors had received his decision. He had retained his close association with Argentine railway affairs and his advice and experience were always ungrudingly at the service of the company.

The Chairman then moved and Sir Sam Fay seconded the adoption of the directors' report and accounts.

Mr. Eddy went on to say that gross receipts were £91,500 above last year. Receipts from livestock and wheat had increased by £201,000. These, combined with smaller increases for cement, stone and wool, had offset effectively the falls in other grain traffics. Parcels and sundry receipts had also shown increases. Receipts from passenger traffic had declined by £9,000, but the numbers carried had increased by 723,000 passengers; this year's figures had been the highest recorded since 1931. This increase had arisen entirely on the suburban service and in spite of a reduction of 1,690 trains run. Expenditure had increased by £102,000; higher prices for fuel and electric current alone had increased costs by £156,000. For many years the company had practised the most rigid economy and every means of reducing expenditure was fully and regularly explored. Train kilometres had decreased by over 1 per cent., and traffic ton-kilometres, the measure of work done, had been 6½ per cent. higher.

Electricity Installations

In the net debit to the capital account in respect of expenditure during the year, amounting to nearly £104,000, was included £97,000 which had been incurred under contracts made pre-war in connection with the change-over in electric installations from a frequency of 25 to 50 cycles. By this means the company would obtain a cheaper supply of electricity for the increasing traffic on the suburban section. When completed this should give an annual economy under present conditions of about £50,000.

The steady and persistent fall in traffics during the first half of the year, coupled with the heavy liability for income tax, and increasing indebtedness to bankers, had made it imperative to obtain an extension of time for the redemption of the £450,000 4 per cent. notes which had fallen due for repayment on January 1 last. Arrangements had been made whereby £395,910 of these notes had been exchanged for a similar amount of 5 per cent. 3-year secured notes redeemable at par on January 1, 1944; the company had agreed to cancel its own holding of £54,090 4 per cent. notes. By this means the immediate pressure on the company's resources had been relieved, but as time went on the board had been compelled to seek permission to defer payment of the company's fixed charges. The scheme of arrangement which had been entered into with the holders of the 4 per cent. and 5 per cent. debenture stocks and the 5 per cent. secured notes providing for a moratorium of the interest payable thereon, had granted the company a respite for two years until July 1, 1943, with provision for extension for one or two further years. Since then, however, an unexpected improvement in the company's fortunes had taken place. Whereas at the middle of March the weekly traffic returns had shown a decrease on the previous year's figures of nearly 2,000,000 pesos, by the end of the financial year this had actually been turned into an increase of more than 1,000,000 pesos.

The Argentine Government had purchased the wheat crop from the agriculturists, and had adopted a policy of bringing the grain to the ports for storage pending export in order to relieve the up-country storage space. This, together with a sustained improvement in livestock traffics, had been responsible for this welcome turn of events. As a result the company was now completely free from debt either to its bankers or the Inland Revenue.

Road Competition

It was clear that the railway industry the world over had to be conducted under different conditions to those which had existed before 1919. This was due to the rapid development of the internal combustion engine, large expenditure on new public roads, and improvement of existing roads. Thus railways were faced with an intense road competition which still had, in the competitive sense, great advantages over the State regulated rail transport systems. Railway rates and fares had had to be drastically reduced. The margin of profit over working costs had greatly narrowed with a consequent serious decrease in net receipts. These conditions applied to every country, but railway undertakings in the Argentine were also handicapped by the grave disadvantage of their receipts being collected in a currency which had suffered serious depreciation in value *vis-a-vis* sterling.

These two factors were the main causes of Argentine railway financial difficulties. It had been repeatedly proved that railway transport was essential and had to be maintained. To do this, railways had to be in a position to provide up-to-date equipment to keep abreast of the times and to give the transport required to fulfil their national function. The capital to do this, however, obviously could not be found unless a fair return could be assured it. In Argentina the problem of stabilising railway finance had been fully recognised. In 1935 a committee with the Minister of Public Works as Chairman had reported upon the railway position and made a series of recommendations among which had figured the following:—(1) That the railways should be granted a special rate of exchange; (2) that local roads should as far as possible not be constructed parallel to the railways; (3) that the basis of the 50 per cent. rebate granted on all Government traffic should be revised; (4) that pooling of receipts between railways should be allowed; (5) that the working of unimportant branches should be allowed on less onerous conditions, and if necessary they should be closed altogether; (6) that door-to-door collection and delivery by the railways should be allowed, and that the railways should be permitted to own motor transport and include it in their capital accounts.

Some of these recommendations had been carried out, but were they to be fully implemented the position would be considerably improved. Representatives continued to negotiate actively with the Government. As a consequence of the war, Argentina had suffered as much as, if not more than, other neutral countries outside the actual war zones.

He believed, however, he could see the sunlight between the clouds. The principles laid down in the Atlantic Charter held out a real hope for the future. He went on to refer to the report which appeared in *The Times* on November 1 of Mr. Sumner Welles' speech in the U.S.A., which contained the following passage:—

> "If the dietary needs of the world's population could be satisfied to the extent necessary to meet minimum standards for sustaining health, the burdensome surpluses which normally trouble producers of many staple products would disappear. I am glad to be able to assure you that this subject is being given preferential attention by agencies of this and other Governments."

To those who worked in a country mainly dependent upon primary products as its source of wealth, such a declaration was of the first importance and augurs well for their future. He was full of faith that postwar re-adjustments would provide a great opportunity to re-establish the fortunes of the railway which were linked to those of the country in which it operated. The directors would leave no stone unturned to secure that re-establishment.

Traffic Prospects

As to the immediate future, gross traffic receipts to date showed an increase of more than 3,000,000 pesos, or 30 per cent. above last year, and there were over 500,000 tons of grain stored at stations and on farms awaiting transport. The prospect for traffics during the coming months was still obscure. It depended upon whether the Government decided to purchase the new crop as it had done this year, and whether it could be transported to the ports for storage or export, in view of the large surpluses already accumulated there.

The General Manager had reported that the crops in general were in good condition, although in the company's westerly zone they had suffered some 20 per cent. damage through drought and frost, and at Colonia Alvear frost had caused damage to the fruit.

The report and accounts were adopted; the retiring directors re-elected; the auditors reappointed; and the proceedings closed with a vote of thanks to the Chairman, directors, and staff.

At the conclusion of the meeting Mr. Eddy invited stockholders to view a film made by the non-British staff of the railway in Argentina, to which reference is made at page 510.

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Trial Run of Southern Railway Pacific Locomotive

On Sunday, November 9, a trial run was arranged by the Southern Railway to test the new Pacific type locomotives of the "Merchant Navy" class, the first of which was described in THE RAILWAY GAZETTE of March 14, 1941 (page 277), on express service. Up to date the first three of these locomotives to be put into traffic have been used for hauling heavy goods trains, particularly between Eastleigh, Salisbury and Exeter, where this type of traffic has increased to such an extent as to demand greater power than was available hitherto. The engines were designed primarily for general service purposes, and passenger traffic has not yet demanded their use, so that the trial last Sunday was intended to demonstrate their ability to handle heavy express trains, particularly over the difficult gradients of the main line between Salisbury and Exeter, should they be required for such work. Meantime they are confined to heavy freight haulage, and can handle 800-ton loads up the steepest banks on the main line, including the 1 in 80 of Honiton.

The train consisted of 16 bogie coaches, weighing 527 tons tare, and No. 21C3, *Royal Mail*, put up a good performance. After a quick acceleration from Waterloo speed restrictions hampered the running for a time, but the 12·4 miles from passing Surbiton to the stop at Woking occupied only 11 min. 12 sec. This stretch concludes with 4 miles of adverse gradient, with an average of 1 in 370. From the restart at Woking the 6·6 uphill miles, averaging about 1 in 315, to milepost 31 were covered in 9 min. 15 sec., with a speed of 60½ m.p.h. at the top of the rise. Along the more level stretches the maximum speed permissible was easily maintained, and the only other outstanding features of the trip were the climb of Honiton bank, mostly at 1 in 80, with a minimum of 25½ m.p.h., behind No. 21C2, *Union Castle*, which took over the train at Salisbury, and the smart start-to-stop run from Sidmouth Junction to Exeter, 12·2 miles in 15 min. 8 sec.

This run amply demonstrated the ability of Mr. O. V. Bulleid's new engines to handle any traffic likely to be assigned to them. Express trains of so great a weight have not hitherto been worked by one locomotive over the heavily-graded Salisbury-Exeter main line.

Notes and News

Brenner Pass Damage.—An Istanbul message says that travellers arriving in Turkey from Italy report that the tunnel on the Italian side of the Brenner Pass was recently damaged by saboteurs.

Singapore-Bangkok Train Service Reduced.—It is officially announced in Singapore that owing to a falling-off in traffic the train service between that city and Bangkok, hitherto twice-weekly, was reduced to once weekly on September 2.

French Railway Accidents.—Two serious accidents are reported from France. On Sunday, November 2, at 8.5 p.m., an Orleans express collided with an empty train at the Austerlitz station in Paris, causing the death of 20 persons. In a collision near Cherbourg, announced by the Vichy radio a few hours after the Paris accident, many persons are reported to have been injured.

Liverpool Corporation Tramways.—Liverpool Corporation is applying to the Minister of War Transport for an Order under the Defence (General) Regulations, 1939, to construct a tramway (1 mile 5 f. 3 ch. in length) in the City of Liverpool and in the rural district of Whiston commencing by a junction with the existing light railway of the Corporation at the city boundary and terminating in Whiston.

Bombay, Baroda & Central India Railway Company.—An extraordinary general meeting of this company will be held at "Guildcroft," Epsom Road, Guildford, Surrey, on November 24, at 11.30 a.m., to consider a resolution "that a sum of £5,000 out of the balance standing to the credit of the Stockholders' Revenue account be paid by way of additional remuneration to the Chairman and directors to be divided among them as they may decide." This meeting will be followed at noon by an extraordinary meeting to consider the Bill now being promoted in Parliament intituled "A Bill for the winding up and dissolution of the Bombay, Baroda & Central India Railway Company and for giving effect to arrangements made with the Governor General of India in Council."

The Hiawatha Diesel-Hauled.—On September 20 the first of two new 4,000-h.p. diesel-electric locomotives was placed in service on one of the regular Hiawatha runs between Chicago and Minneapolis. The other unit was similarly put into service a few days later. Thus two of the four regular Hiawatha streamlined trains of the Chicago, Milwaukee, St. Paul & Pacific Railroad are now diesel-powered. The remaining two continue to work, as hitherto, by steam locomotives.

Serious Pennsylvania Accident.—A Pennsylvania express became derailed and collided with a signal box near Dunkirk, Ohio, on November 9, causing 11 deaths. A cylinder head from a goods engine on an adjacent track caused the derailment.

Ulster Railways.—Mr. G. H. Robb, Leader of the Northern Ireland House of Commons, stated on November 4 that his Government had no power to assume control of the railways in Ulster, and nothing had arisen which would indicate that it was necessary. He was replying to a suggestion by Mr. T. McLaughan that railways in Northern Ireland should be treated on a parity with those in Great Britain.

Transport of Milk.—At the annual general meeting of United Dairies Limited held in London recently Mr. Joseph H. Maggs, the Chairman, said he wished to express his gratitude to the public services for their great help to his company during wartime difficulties of distribution, and in particular to the railway companies on which it relied for the transport of a large part of the milk from the country to London.

Canadian Pacific Railway.—Gross earnings for September were $19,268,000, an increase of $3,621,000, and expenses were $15,801,000, or $3,140,000 higher. Net earnings at $3,467,000 were $481,000 more than for September, 1940. For the first nine months of 1941 gross earnings were $158,457,000, an increase of $36,609,000, and the net earnings of $29,728,000 were $9,438,000 greater than for the first nine months of 1940.

Canadian National Railways.—Mr. R. C. Vaughan, President of the company, is reported from New York as saying that the surplus for the current year is expected to be between $3,000,000 and $5,000,000. This will be the first surplus since 1929 and the highest in the history of the railway. It is estimated that net profits will be from $66,000,000 to $68,000,000 before allowance for fixed charges and taxes amounting to $63,000,000.

Railway Freight Rebates.—The Railway Rates Tribunal will sit at 10.30 a.m. on Tuesday, November 25, at the office of the tribunal, Bush House, Aldwych, London, to review the operation of the Railway Freight Rebates Scheme for the year ended September 30, 1941. Any railway company to which the said scheme applies or representative body of traders interested which may desire to be heard must file a notice at the office of the tribunal on or before November 20.

Murex Limited.—A resolution to convert all the issued and fully paid-up shares in the capital of this company into stock transferable in units of £1 each was unanimously carried at the close of the ordinary general meeting on November 6.

Price Control in Canada.—After November 16, prices for most goods in Canada must not rise above the highest levels reached in the period September 15 to October 11, reports Reuters. A fine of $5,000 (over £1,000) and two years imprisonment is prescribed as a penalty for offences. A wide range of services, including railways, telegraphs, telephones, electricity, gas, steam heat, water, restaurants, and cinemas, are scheduled in the Order which has been made.

Chengchow Recaptured by the Chinese.—The important junction of Chengchow in northern Hunan (China) has been recaptured by the Free Chinese forces, after having been in Japanese occupation for about a month. It is the junction between the Peking-Hankow (north-south) and Lung-Hai (east-west) trunk lines, and its recapture will enable the Chungking Government to restore through communication from Paochi and Sian, in the north-west, with Sinyang, some 100-odd miles north of Hankow.

New Industry for Nyasaland.—Reference to experiments in the production of tung oil in Nyasaland were made by Mr. W. M. Codrington in his address at the recent annual general meeting of Nyasaland Railways Limited. He said that the Government of the Colony had now decided to assist the development of this production by the establishment of a research station. The Nyasaland Railways had quoted a special experimental rate which would, it was hoped, assist the development of this new industry for Nyasaland.

New Niagara Falls Bridge Opened.—On page 232 in our issue of February 4, 1938, we recorded the destruction of the Niagara Falls View bridge, owned by the International Railway Company, due to an unprecedented ice-jam in the gorge below. It was also stated that the intention was to replace the bridge, and this has now been done. The new Rainbow bridge across the great falls was opened for pedestrian traffic on October 30. This fixed-end 950-ft. steel arch span is said to be the longest of its kind and to have cost nearly £1,000,000.

XUM

OFFICIAL NOTICES

The Bombay, Baroda and Central India Railway Company

NOTICE is hereby given that an Extraordinary General Meeting of the above Company will be held at the temporary offices of the Company, "Guildcroft," Epsom Road, Guildford, Surrey, on Monday, the 24th day of November, 1941, at 11.30 o'clock in the forenoon for the purpose of considering and (if thought fit) passing the following Resolution, viz. :—

"That a sum of Five thousand pounds out of the balance standing to the credit of the Stockholders' Revenue Account be paid by way of additional remuneration to the Chairman and Directors to be divided among them as they may decide."

Dated the fifth day of November, 1941.

By Order of the Board.
N. LINCOLN,
Secretary.

Offices : The White Mansion,
91, Petty France,
Westminster,
London, S.W.1.

Temporary Offices : "Guildcroft,"
Epsom Road,
Guildford.

Official Notice

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Friday. All advertisements should be addressed to: —*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

It may be remembered that it was dedicated by the King and Queen in June, 1939, and, though railway-owned, carries no railway ; it was used mainly for sightseers.

Great Southern Railways (Eire).—For the 43rd week of 1941 the Great Southern Railways Company reports passenger receipts of £36,489 (against £34,321), and goods receipts of £77,667 (against £62,943), making a total of £114,156, against £97,264 for the corresponding period of the previous year. The aggregate receipts to date are passenger £1,727,250 (against £1,538,610), goods £2,279,412 (against £2,041,357), making a total of £4,006,662 (against £3,579,967).

Mogyana Railways Bonds Redemption.—Separate meetings of the holders of three series of sterling bonds of the Mogyana Railways Company were held on Friday, October 31, at Winchester House, Old Broad Street, E.C., and by the requisite majorities passed resolutions in favour of a scheme for purchase of these bonds at the price of £34 10s. for each £100 bond. The bonds concerned were the Sul Mineira Extensions first mortgage 5 per cent. (1911) ; the first mortgage 5 per cent. (1914) ; and the first mortgage 6 per cent. (1927). The total purchase price is to be £1,254,834.

Railway and other Reports

Belfast & County Down Railway Company.—The directors have declared a dividend on the 4½ per cent. "A" preference stock for the half year ended June 30 last.

Bahia Blanca & North Western Railway Co. Ltd.—The board reports that the guaranteed rental of £440,000 due from the Buenos Ayres Great Southern Railway Co. Ltd., in respect of the year ended June 30, 1941, has been received, and the £98,000 interest on the first debenture stock, the £135,000 interest on the 4½ per cent. second debenture stock, and the dividend of £207,000 on the 4½ per cent. guaranteed stock have been duly paid. The provision of £10,350 for N.D.C. is recoverable from the working company, which has also paid the London office expenses and directors' fees, amounting to £3,044.

Silverton Tramway Co. Ltd.—Revenue for the year to June 30, 1941, was £146,006, against £158,251 for 1939-40. Expenses and taxes were £96,379 (£98,274), and net profit after depreciation and directors' fees amounted to £44,411 (£53,915). Adding £31,381 balance forward from June 30, 1940, gives a total available of £75,792 (£87,267). From this total £50,000 has been deducted for dividends paid on August 28, 1940, and February 28, 1941, and £973 has been transferred to insurance reserves, leaving a balance of £24,819, from which £18,750 is appropriated for dividend of 9d. a share, making 1s. 9d. a share for the year.

Thos. W. Ward Limited.—The report shows a profit of £194,845 (£193,170). A sum of £5,000 is allocated to employees' benefit fund. Final dividend is 7½ per cent., making 11½ per cent. for the year (same). The final dividend on employees' shares is 18s. 1½d. per cent., making £5 18s. 1½d. per cent., tax free (£6 15s. 0d. per cent., tax free). To reserve is allocated £25,000.

Murex Limited.—The balance of profit and loss account for the year to June 30 last, after providing for all expenses, but before taxation, is £583,222 (£526,408). Taxation reserves takes £370,000 (£302,353), and the net profit is £213,222, against £224,055. The directors recommend a final dividend of 10 per cent., together with a cash bonus of 2½ per cent., both less income tax, making 20 per cent., less tax, for the year (same). £106,000 is allocated to reserves and the carry forward is £107,145, against £103,423 brought in.

Contracts and Tenders

The National Steel Company of Brazil is enquiring for a total of eight steam locomotives comprising six of the 0-8-0 type.

The Egyptian State Railways are reported to be enquiring for a total of 2,860 freight wagons as follows :—

1,200—34-ft., 40-ton steel box
1,200—34-ft., 40-ton low-side gondola
400—34-ft., 40-ton flat
60—caboose

The United States War Department is reported to have issued enquiries for the immediate purchase of a considerable number of 2-8-2 steam locomotives. The quantity to be ordered is estimated at between 100 and 200 locomotives, and likely to total 200. (The British Purchasing Commission was also reported to be enquiring for 50 2-8-0 steam locomotives.) Plans call for materials for these locomotives to receive an A-1-A priority rating, and it is understood the specifications for some of the War Department locomotives indicate that they may be intended for export. Production of these locomotives is said to be scheduled for division among the leading U.S.A. steam locomotive builders.

Large orders are being placed by the Chilean State Railways Administration for locomotives and electrical equipment. The local firm of Wessel, Duval & Company is to supply, at a total cost of $922,255 United States currency, seven switching locomotives and six complete sets of equipment for converting local passenger to freight-type locomotives. Also to be supplied under the same contract are 12 sets of voltage-balancing equipment, two motor generator sets for the Llai-Llai and Vina del Mar substations, with accessories, and a complete electrical installation for the substation to be erected at Los Andes. These purchases are being made through the Chilean Development Corporation. At the same time, the Public Works Department has contracted with a Santiago firm for the construction, at a price of 232,675 pesos each of two 40-seater railcars for the railways under construction from Freire to Tolten and from Cucero to Puyehue.

British and Irish Railway Stocks and Shares

Stocks	Highest 1940	Lowest 1940	Prices Nov. 7, 1941	Prices Rise/Fall
G.W.R.				
Cons. Ord.	52	22⅛	40½	+ ½
5% Con. Pref. ...	103½	58	103½	+ 1
5% Red. Pref. (1950)	105½	88	103	—
4% Deb.	107½	90½	112½	+ 1
4½% Deb.	108½	96½	113	—
4½% Deb.	114½	96	117½	—
5% Deb.	124	106	130	—
2½% Deb.	66½	57	67	—
5% Rt. Charge ...	117½	97	127½	—
5% Cons. Guar. ...	117	90½	125½	—
L.M.S.R.				
Ord.	24⅞	9	15½	+ ½
4% Pref. (1923) ...	60½	21⅜	48½	—
4% Pref.	70½	35	62½	—
5% Red. Pref. (1955)	94½	60	91½	—
4% Deb.	101⅜	81	104⅛	—
5% Red. Deb. (1952)	109½	102	109½	—
4% Guar.	93½	65	95½	—
L.N.E.R.				
5% Pref. Ord. ...	8⅛	1½	2⅝	+ ⅛
Def. Ord.	4⅛	1½	1½	—
4% First Pref. ...	60	20	47½	—
4% Second Pref. ...	22⅝	6½	16½	— ½
5% Red. Pref. (1955)	80	34½	76½	—
4% First Guar. ...	86½	56	87⅛	—
4% Second Guar. ...	77½	37	75½	—
3% Deb.	73½	54½	77⅛	—
4% Deb.	97⅜	74	103½	—
5% Red. Deb. (1947)	107	96½	103	—
4½% Sinking Fund Red. Deb.	104	98	102½	+ 1
SOUTHERN				
Pref. Ord.	79	34	61½	—
Def. Ord.	22½	7	13½	—
5% Pref.	104½	58¾	101½	+ 1
5% Red. Pref. (1964)	105	85	103½	—
5% Guar. Pref. ...	116¾	90	125½	—
5% Red. Guar. Pref. (1957)	114⅞	94	112½	—
4% Deb.	106¾	84½	110½	—
5% Deb.	122½	100	127½	—
4% Red. Deb. (1962–67)	106	96½	106	—
4% Red. Deb. (1970–80)	106⅜	93	106	—
FORTH BRIDGE				
4% Deb.	95½	87	96½	—
4% Guar.	93½	81½	97½	—
L.P.T.B.				
4½% "A"	116	103	117½	—
5% "A"	121½	107	129	—
4½% "T.F.A." ...	105½	101	101½	—
5% "B"	116	102	116½	—
"C"	65½	24	40	—
MERSEY				
Ord.	26	18½	20½	—
4% Perp. Deb. ...	92½	86½	99½	—
3% Perp. Deb. ...	68	63	72½	+ 2
3% Perp. Pref. ...	57	50½	56	—
IRELAND				
BELFAST & C.D.				
Ord.	4	3	4	—
G. NORTHERN				
Ord.	4½	1½	12½	— 1⅛
G. SOUTHERN				
Ord.	12½	4	9½	—
Pref.	15½	6	12½	+ ½
Guar.	36	15	28½	+ 1½
Deb.	55½	40	57	+ ½

XUM

Railway Stock Market

The Prime Minister's speech and the trend in the war news from Russia assisted Stock Exchange markets earlier in the week. Security values showed a fairly wide-spread improvement, and in many directions responded strongly to moderate increase in buying. Steady demand continued for British Funds, and among other high-class investments, home railway prior charges fully maintained the further gains recorded a week ago. Moreover, improvements of half-a-point were recorded among junior home rails, but the rally in the latter was moderate compared with the gains shown in securities of Argentine and other South American railways. The strong revival of speculative activity in ordinary and preference stocks of the latter, which cannot, of course, be expected to return to the dividend list for a considerable period, reflects growing confidence of improving economic conditions in South America assisted by increasing demand from the U.S.A. Sentiment has been aided by the contract for the purchase by Great Britain of large quantities of meat, and also by the decision to allow the Argentine railways to increase the sums they may remit in 1941 at a special rate. It is realised that much of the buying of preference and ordinary stocks of the Argentine railways is speculative, but on the other hand, a good deal of the demand for debentures has been on the part of investors prepared to take the long view. The better tendency in home railway securities is, of course, due mainly to the improvement in the market trend generally, but it has been accompanied by talk of the possibility of an early statement giving much further information of the position of the railways as to the war damage insurance scheme. Until the position in this respect is clarified it will, of course, be impossible to assess dividend prospects of the junior stocks. Nevertheless, the view prevails in the market that there are reasonable grounds for the assumption that dividend rates are likely to be maintained.

At the time of writing, Great Western ordinary stock has rallied to 40½, which compares with 39¾ a week ago. Moreover, Great Western preference and debenture stocks have fully held their recent gains at 104 and 112½ respectively. L.M.S.R. ordinary participated in the better tendency with a fractional gain from 15 to 15¾. On the other hand, L.M.S.R. 1923 preference, 48 at the time of writing, was fractionally below the price current a week ago, although the senior preference has improved from 62½ to 63. L.M.S.R. debentures were very firm at 105, as was the guaranteed stock at 96. Among L.N.E.R. guaranteed issues, the firsts and seconds at 88 and 76½ respectively, were unchanged on balance. Whereas L.N.E.R. first preference was fractionally lower on balance at 47, the second preference was half-a-point better at 16¾. There was, also, further buying of Southern preference stock, which at 102½ was a point higher than a week ago, the yield having attracted attention. Southern 4 per cent. debentures held their recent rise to 111. Moreover, this railway's preferred and deferred stocks had a more active appearance, and were slightly higher on balance at 61⅜ and 13⅜ respectively. Among London Transport issues, the 4½ per cent. "A" at 118¼ more than maintained its recent rise, while the "C" stock has improved slightly from 39¾ to 40 at the time of writing.

Factors which have influenced sentiment as to Argentine and other South American railway stocks have been mentioned above. Due to the firmness with which these securities are held, they are in short supply and consequently, the rise in values has tended to be out of proportion to the demand experienced, and some strong gains have been recorded. Among debentures, for instance, B.A. Gt. Southern 4 per cents. were 56½, compared with 52 a week ago; B.A. Western 4 per cents., 42, compared with 38; and Central Argentine 5 per cents., 42½ compared with 35½. Elsewhere, San Paulo, Leopoldina and Antofagasta issues participated in the general improvement. Central Uruguay second debentures rose strongly on talk of interest resumption possibilities early in the New Year. Canadian Pacific moved higher.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1940-41	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1940	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1940	Prices: Lowest 1940	Prices: Nov. 7, 1941	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	2.11.41	19,910	+ 5,280	44	848,230	745,900	+ 102,330	Ord. Stk.	11¼	3½	10½	Nil
	Argentine North Eastern ...	753	1.11.41	ps. 176,400	+ ps.32,100	18	ps. 3,596,900	ps.3,101,700	+ ps.495,200	,,	3½	1	3	Nil
	Bolivar	174	Oct., 1941	3,650	+ 470	43	38,504	39,150	– 646	6 p.c. Deb.	6½	5	7	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	8	5	6½	Nil
	Buenos Ayres & Pacific ...	2,801	25.10.41	ps.1,290,000	+ ps.200,000	17	ps.21,660,000	ps. 19,014,000	+ ps.2,646,000	Ord. Stk.	4½	1	6	Nil
	Buenos Ayres Great Southern	5,082	25.10.41	ps.2,232,000	+ ps.305,000	17	ps.35,504,000	ps.31,621,000	+ ps.3,883,000	Ord. Stk.	10⅛	3	10	Nil
	Buenos Ayres Western ...	1,930	25.10.41	ps. 921,000	+ ps.231,000	17	ps.13,843,000	ps.10,683,000	+ ps.3,160,000	,,	8⅜	2	7½	Nil
	Central Argentine	3,700	1.11.41	ps. 1,877,800	+ ps.526,700	18	ps.33,131,950	ps. 25,064,050	+ ps.8,037,900	,,	8½	2	7½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	4	⅛	2	Nil
	Cent. Uruguay of M. Video	972	25.10.41	23,998	+ 348	17	372,467	314,781	+ 57,686	Ord. Stk.	3½	¼	6	Nil
	Costa Rica	188	Sept., 1941	21,437	+ 5,073	13	68,996	57,220	+ 11,776	Stk.	23¼	14	12	16⅔
	Dorada	70	Sept., 1941	12,000	– 200	39	112,750	110,700	+ 2,050	1 Mt. Db.	99	97½	97	6⅛
	Entre Rios	808	1.11.41	ps.231,400	+ ps.28,700	18	ps. 5,237,100	ps. 4,231,100	+ ps 1,006,000	Ord. Stk.	4	⅛	5	Nil
	Great Western of Brazil ...	1,016	1.11.41	14,700	+ 1,500	44	414,300	442,200	– 27,900	Ord. Sh.	4/-	1/-	½	Nil
	International of Cl. Amer. ...	794	Sept., 1941	$367,431	+ $41,642	39	$4,257,101	$4,405,419	– $148,318	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	9d.	9d.	½	Nil
	La Guaira & Caracas... ...	22¾	Oct.,1941	7,445	+ 650	43	65,445	67,095	– 1,650	—	6	4	—	—
	Leopoldina	1,918	18.10.41	29,786	+ 2,498	42	1,098,598	955,105	+ 143,493	Ord. Stk.	2⅞	¼	4	Nil
	Mexican	483	31.10.41	ps. 419,200	– ps.31,300	17	ps.5,324,100	ps. 4,726,900	+ ps.597,200	,,	2/11½	1/8	3/8	Nil
	Midland of Uruguay ...	319	Sept., 1941	13,499	+ 1,530	13	40,979	33,560	+ 7,419	—	—	—	—	—
	Nitrate	386	31.10.41	7,814	+ 1,827	43	122,844	146,673	– 23,829	Ord. Sh.	2½	1	3	4⅔
	Paraguay Central	274	1.11.41	$3,786,000	+ $821,000	18	$50 478,000	$62 813,000	– $2,335,000	Pr. Li. Stk.	41	36	42½	7⅛
	Peruvian Corporation ...	1,059	Oct.,1941	73,593	+ 6,715	17	292,346	265,325	+ 27,021	Pref.	4	1	5	Nil
	Salvador	100	Aug., 1941	c47,093	+ c11,877	9	c111,172	c86,683	+ c24,489	—	—	—	—	—
	San Paulo	153½	26.10.41	32,250	– 7,275	43	1,588,470	1,561,099	+ 27,371	Ord. Stk.	50	23	49½	4⅓
	Taltal	160	Sept.,1941	7,225	+ 5,050	13	16,390	6,725	+ 9,665	Ord. Sh.	15/1½	⅜	¾	Nil
	United of Havana	1,346	1.11.41	17,663	+ 3,710	18	341,976	276,268	+ 65,708	Ord. Stk.	⅜	¼	2	Nil
	Uruguay Northern	73	Sept., 1941	1,219	+ 208	13	3,910	2,937	+ 973	—	—	—	—	—
Canada	Canadian National	23,560	31.10.41	1,952,990	+ 368,326	43	49,814,504	40,280,194	+ 9,538,310	—	—	—	—	—
	Canadian Northern ...	—	—	—	—	—	—	—	—	Perp. Dbs.	86	68	92½	4⅓
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gr.	105½	95½	101¼	3½
	Canadian Pacific	17,153	31.10.41	1,492,200	+ 313,600	43	36,007,000	27,729,800	+ 8,277,200	Ord. Stk.	9 1/16	4⅛	12	Nil
India†	Assam Bengal...	1,329	—	—	—	—	—	—	—	Ord. Stk.	99⅜	71	100	3
	Barsi Light	202	Aug., 1941	9,742	+ 2,160	22	77,782	64,620	+ 13,162	—	—	—	—	—
	Bengal & North Western ...	2 099	Sept.,1941	231,525	– 4,522	26	1,530,171	1,514,900	+ 15,271	Ord. Stk.	283	234	307	5⅛
	Bengal-Nagpur	3,269	10.7.41	222,300	+ 27,943	14	2,552,246	2,417,662	+ 134,584	,,	96	83¾	100¼	4
	Bombay, Baroda & Cl. India	2,986	31.10.41	304,800	+ 22,425	29	6,076,725	5,651,925	+ 424,800	,,	108	99	107½	5⅛
	Madras & Southern Mahratta	2,939	20.8.41	199,875	+ 58,531	20	2,850,619	2,386,211	+ 464,408	,,	104	97⅛	102¼	7⅛
	Rohilkund & Kumaon ...	546	Sept., 1941	41,025	– 4,737	26	347.627	347.049	+ 578	,,	284	238	300	5⅓
	South Indian	2,500	10.8.41	136.398	+ 13,893	19	1,860,584	1,640,073	+ 220,511	,,	93¾	83	97½	4⅛
Various	Beira	204	July, 1941	74,593	—	43	727,546	—	—	—	—	—	—	—
	Egyptian Delta	610	31.7.41	7,912	+ 2,864	18	82,025	56,624	+ 25,401	Prf. Sh.	7/10½	⅜	2	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	44⅛	64	5⅞
	Midland of W. Australia ...	277	May, 1941	17,591	+ 3,683	48	167,924	145,304	+ 22,620	Inc. Deb.	88	80	89½	6⅓
	Nigerian	1,900	28.6.41	44,945	– 12,185	13	697,96.	499.238	+ 198,730	—	—	—	—	—
	Rhodesia	2,442	July, 1941	464,690	—	43	4,682,300	—	—	—	—	—	—	—
	South Africa	13,291	27.9.41	788,722	+ 63,377	26	19,364,720	17,463,590	+ 1,901,130	—	—	—	—	—
	Victoria	4,774	July, 1941	955,039	+ 86,611	4	955,039	868,428	+ 86,611	—	—	—	—	—

Note Yields are based on the approximate current prices and are within a fraction of ⅛ Argentine traffics are given in pesos
† Receipts are calculated @ 1s. 6d. to the rupee